Vol. 1010 Number 4

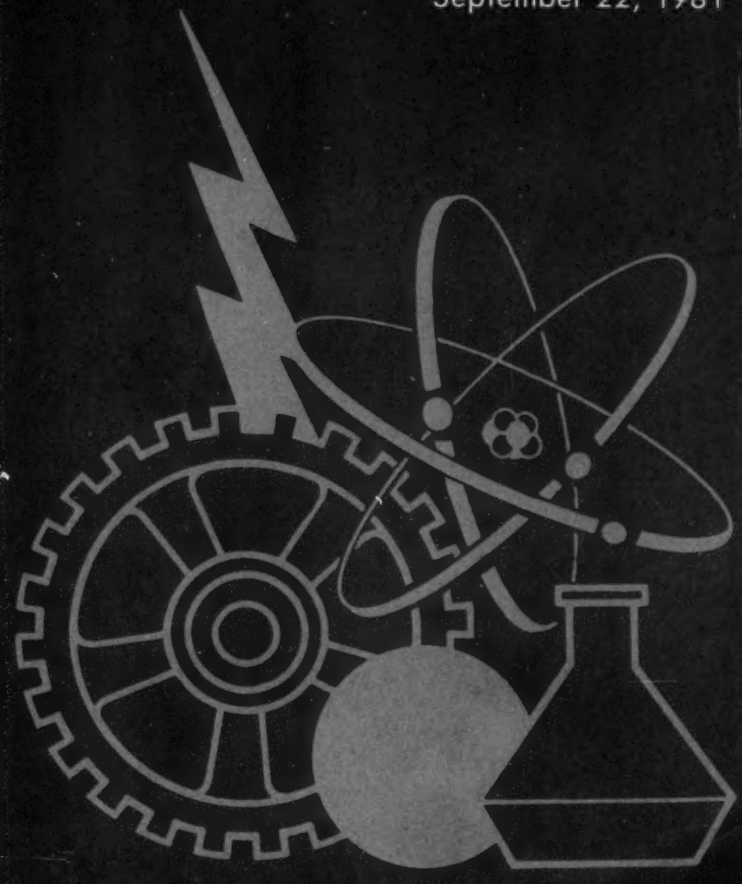
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 22, 1981



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Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 22, 1981 Volume 1010 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,963,531, Re. S.N. 260,906, Filed May 6, 1981, Cl. 148/31.5, COLD ROLLED, DUCTILE, HIGH STRENGTH STEEL STRIP AND SHEET AND METHOD THEREFOR, James A. Elias, et al., Owner of Record: *Armco, Inc., Middletown, Ohio,* Attorney or Agent: Joseph V. Hoffman, et al., Ex. Gp.: 111

4,042,135, Re. S.N. 256,185, Filed Apr. 21, 1981, Cl. 414/718, LOAD HANDLING VEHICLE, Stuart Pugh, et al., Owner of Record: *The Liner Concrete Machinery Co., Ltd., Tyne and Wear, England,* Attorney or Agent: Neil B. Siegel, Ex. Gp.: 314

4,067,754, Re. S.N. 260,904, Filed May 6, 1981, Cl. 148/12F, COLD ROLLED, DUCTILE, HIGH STRENGTH STEEL STRIP AND SHEET AND METHOD THEREFOR, James A. Elias, et al., Owner of Record: *Armco, Inc., Middletown, Ohio,* Attorney or Agent: Joseph V. Hoffman, et al., Ex. Gp.: 111

4,148,546, Re. S.N. 251,929, Filed Apr. 7, 1981, Cl. 339/192, ELECTRICAL POWER DISTRIBUTION ASSEMBLY, Lester E. Wilson, Jr., et al., Owner of Record: *Inventor,* Attorney or Agent: Richard J. Birch, Ex. Gp.: 322

4,245,141, Re. S.N. 261,456, Filed May 7, 1981, Cl. 200/314, ELECTRICAL SWITCHES, David Aspden, Owner of Record: *Lucas Industries Ltd., Birmingham, England,* Attorney or Agent: John Clark Holman, et al., Ex. Gp.: 243

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,518,946, Reexam. No. 90/000,059, Requested: Aug. 21, 1981, Cl. 104/174, PUSHER CONVEYOR FOR WHEELED CARRIERS, Shelden M. Kavieff, Owner of Record: *Jervis B. Webb Co.,* Attorney or Agent: Farley, Forster & Farley, Ex. Gp.: 316, Requester: Armstrong, Nikaido, Marmelstein & Kubovcik, Washington, D.C.

3,634,973, Reexam. No. 90/000,060, Requested: Aug. 25, 1981, Cl. 51/2R, APPARATUS FOR ABRADING BY EXTRUSION AND ABRADING MEDIUM, Ralph W. McCarty, Owner of Record: *Extrude Hone Corp.,* Attorney or Agent: Baldwin, Egan, et al., Ex. Gp.: 323, Requester: Dynetics Corp., c/o Thompson, Birch, Gauthier & Samuels, Boston, Mass.

Vacancy Announcement
Chairman, Trademark Trial and Appeal Board

In accordance with the Senior Executive Service, the position of Chairman of the Trademark Trial and Appeal Board is being advertised. This appointment will be made at a salary of $50,113 per annum, which is the current statutory limit before awards and bonuses are distributed.

Persons interested in being considered for the vacancy, PTO-81-112, are invited to submit their applications to the address given below, on or before Sept. 30, 1981. Applications must be in the Office of Personnel by Sept. 30, 1981. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

Duties: Serves as Chairman, Trademark Trial and Appeal Board. Manages the administrative functions of the Board and supervises the technical work of the Board. As a member of the TTAB, exercises original jurisdiction in *inter partes* proceedings and appellate jurisdiction of *ex parte* appeals. Renders written decisions representing the position of the PTO.

Qualifications: Evaluation of qualified candidates will be on the basis of education (self-development), awards, supervisory performance appraisals, managerial/executive qualifications and technical/professional qualifications. Candidates should address all these qualifications in their supplemental statements. Copies of the Qualification Standard are available in Crystal Plaza 2, Room 9C05.

Factors Which Will be Considered in Evaluating Qualified Candidates:

The six managerial/executive factors for SES positions are:

1. Integration of internal and external program policy issues;
2. Organization representation and liaison;
3. Direction and guidance of program, projects or policy development;
4. Resource acquisition and administration;
5. Utilization of human resources;
6. Review of implementation and results.

The technical/professional qualifications are:

1. Law degree and bar membership;
2. Professional legal experience which has provided a comprehensive knowledge of Appellate matters in Trademark law, rules of evidence, the Federal Rules of Civil Procedure, and general principles of ancillary legal subjects;
3. Demonstrated ability to express thoroughly, clearly and accurately the material facts, legal principles and

reasons for arriving at a stated conclusion by the application of law to the facts.

Employees of the Department of Commerce may apply by submitting a Merit Program Interest Statement (CD-261), OPM Form 1386, current performance appraisal, updated Personal Qualifications Statement (SF-171) and supplemental statement showing how the qualifications are met. Persons who are not employees of the Department of Commerce should submit a current performance appraisal, Personal Qualifications Statement (SF-171), OPM Form 1386, and supplemental statement. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Crystal Plaza 2, Room 9C05
2011 Jefferson Davis Hwy.
Arlington, Va. 22202

Questions concerning this notice should be directed to Ms. Marilyn Gannon, Office of Personnel, Room 2-9C05, Telephone (703) 557-3631.

MARGARET M. LAURENCE
July 27, 1981 *Assistant Commissioner for Trademarks.*

Reorganization of Trademark Examining Operation

The Trademark Examining Operation will be undergoing a reorganization from mid-September through October. The reorganization includes decentralizing the clerical staff, adding a sixth examining division, and reassigning trademark examining attorneys and goods and services classes among the divisions. Office space is being remodelled to accommodate these changes. Due to required construction on the second and third floors of Crystal Plaza Bldg. 2, some inconvenience is anticipated.

The Public Search Room will remain open during normal public hours of 8:00 a.m. to 5:30 p.m. However, access to application files may be interrupted at times.

After reorganization, it will be important for all correspondence and inquiries pertaining to a trademark application to identify the examining division and the trademark examining attorney handling the application. If the applicant has not yet been notified of the division number and the name of the examining attorney, correspondence should be addressed to the division which handles the class of goods or services covered by the application.

New telephone numbers will be assigned to several areas of the Trademark Examining Operation. When installed, these numbers will be published in the *Official Gazette.*

Your cooperation during this reorganization will be appreciated. Any questions relating to the reorganization should be directed to the office of the Director of the Trademark Examining Operation, 703-557-3268.

MARGARET M. LAURENCE,
Sept. 1, 1981. *Assistant Commissioner for Trademarks.*

Energy-Related Inventions

This is a reminder that under Public Law 93-577, the National Bureau of Standards (NBS) evaluates "all promising energy-related inventions, particularly those submitted by individual inventors and small companies" for the purpose of obtaining grants from the Department of Energy. For further information write to: Office of Energy-Related Inventions/NBS, Washington, D.C. 20234, (phone (301) 921-3694).

PATENT NOTICES

Certificates of Correction for the Week of Sept. 22, 1981

Re. 30,430	4,262,999	4,271,166	4,276,189
4,104,295	4,263,029	4,271,430	4,276,242
4,122,029	4,263,087	4,271,465	4,276,277
4,178,843	4,263,121	4,271,489	4,276,334
4,198,175	4,263,209	4,271,519	4,276,475
4,198,487	4,263,391	4,271,875	4,276,484
4,201,779	4,263,459	4,271,945	4,276,760
4,231,642	4,263,565	4,272,092	4,276,875
4,231,999	4,263,567	4,272,148	4,277,035
4,233,736	4,264,534	4,272,155	4,277,123
4,237,928	4,264,591	4,272,292	4,277,148
4,239,519	4,264,940	4,272,339	4,277,340
4,242,124	4,265,952	4,272,454	4,277,505
4,242,607	4,266,082	4,272,509	4,277,570
4,242,956	4,267,142	4,272,519	4,277,605
4,247,386	4,267,504	4,272,682	4,277,642
4,248,160	4,267,659	4,272,788	4,277,959
4,251,082	4,268,476	4,272,859	4,278,073
4,251,115	4,268,596	4,272,895	4,278,089
4,251,434	4,268,841	4,272,899	4,278,094
4,251,700	4,268,850	4,272,985	4,278,106
4,251,828	4,268,900	4,273,064	4,278,166
4,252,681	4,268,943	4,273,079	4,278,241
4,253,743	4,269,269	4,273,118	4,278,264
4,253,985	4,269,691	4,273,530	4,278,446
4,254,225	4,269,757	4,273,983	4,278,689
4,254,451	4,269,859	4,274,251	4,278,762
4,255,336	4,269,898	4,274,326	4,278,893
4,256,753	4,269,947	4,274,355	4,278,966
4,256,833	4,270,024	4,274,433	4,279,238
4,256,891	4,270,089	4,274,443	4,279,271
4,257,456	4,270,115	4,274,651	4,279,291
4,257,872	4,270,116	4,274,849	4,279,311
4,258,919	4,270,309	4,274,855	4,279,535
4,259,424	4,270,499	4,275,156	4,279,611
4,259,947	4,270,658	4,275,202	4,279,851
4,260,229	4,270,936	4,275,850	4,280,274
4,260,259	4,271,013	4,275,863	4,280,319
4,260,483	4,271,048	4,275,974	4,280,379
4,261,977	4,271,078	4,276,004	4,281,172
4,262,717	4,271,158	4,276,019	4,281,406

Disclaimers

3,916,997.—*Larry J. Douglas* and *Charles B. Wenger,* Denver, Colo. OIL RECOVERY WITH HIGH CONDUCTIVITY MICELLAR SYSTEMS. Patent dated Nov. 11, 1975. Disclaimer filed July 6, 1981, by the assignee, *Marathon Oil Co.*

Hereby enters this disclaimer to claims 5 and 9 of said patent.

4,088,025.—*Bill D. Foster,* Ankeny; *John T. Comiskey,* Johnston; and *LeRoy H. Degner,* Des Moines, Iowa. MATERIAL SAMPLING APPARATUS. Patent dated May 9, 1978. Disclaimer filed June 22, 1981, by the assignee, *Elevator Contractors, Inc.*

Hereby enters this disclaimer to claims 10–14 of said patent.

4,250,714.—*Allan P. Covy,* Palos Verdes Estates, Calif. METHOD FOR COOLING METAL TURNINGS. Patent dated Feb. 17, 1981. Disclaimer filed July 31, 1981, by the inventor.

The term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

4,263,157.—*Eginhard Steiner,* Fullinsdorf and *Andreas Schmidt,* Reinach, Switzerland. CHLORINATED DERIVATIVES OF BUTYRIC ACID AS USEFUL LUBRICANT ADDITIVES AND LUBRICANTS CONTAINING SAME. Patent dated Apr. 21, 1981. Disclaimer filed July 9, 1981, by the assignee, *Ciba-Geigy Corp.*

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 8 of said patent.

Disclaimer and Dedication

4,180,606.—*Charles M. Hance,* Woodruff and *Charles D. Martin,* Greer, S.C. FABRICS HAVING FLOCKED CORDUROY RIBS. Patent dated Dec. 25, 1979. Disclaimer and Dedication filed July 2, 1981, by the assignee, *M. Lowenstein Corp.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE ARMY/OTJAG
Chief, Intellectual Property Division
Room 2D 444, Pentagon
Washington, D.C. 20310

Patent application 6–189,399. Frequency Selectable Q-Switched Laser. Filed Sept. 22, 1980.

Patent application 6–193,225. Cover Hold Down Mechanism. Filed Oct. 2, 1980.

Patent application 6–194,736. Heterodyne Indicial Refractometer. Filed Oct. 7, 1980.

Patent application 6–196,409. A Dual Channel Correlator for an FM CW Ranging Radar. Filed Oct. 14, 1980.

Patent application 6-200,297. Trailer Frame Beam. Filed Oct. 4, 1980.

Patent application 6-200,832. System and Method for Testing the Reaction of Rare Earth Ions. Filed Oct. 28, 1980.

Patent application 6-202,261. Thin Film Plane-Polarized Intensity Pickoff. Filed Oct. 30, 1980.

Patent application 6-210,068. Heat Exchanger Base for a Portable Laser System. Filed Nov. 24, 1980.

Patent application 6-216,416. Intergrating Angular Accelerometer. Filed Dec. 15, 1980.

Patent application 6-217,349. Electrostatic Safe Electric Match. Filed Dec. 17, 1980.

Patent application 6-217,881. Fluidic-Controlled Oxygen Intermittent Demand Flow Device. Filed Dec. 18, 1980.

Patent application 6-219,455. Doppler Discrimination of Aircraft Targets. Filed Dec. 22, 1980.

Patent application 6-220,485. Impedance Tapered Dematron. Filed Dec. 29, 1980.

Patent application 6-221,953. Anode Mounting for Window Type Geiger-Mueller Tube. Filed Dec. 31, 1980.

Patent application 6-241,785. Band Interacting Tunnel Heterojunction. Filed Mar. 9, 1981.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP
1900 Half St., S.W.
Washington, D.C. 20324

Patent application 6-219,397. Vacuum Blast Adapter for Bombs. Filed Dec. 22, 1980.

Patent application 6-222,845. Corrosion Monitoring System. Filed Jan. 6, 1981.

Patent 4,255,478. Composite Structures. Filed Mar. 14, 1979. Patented Mar. 10, 1981. Not available NTIS.

Patent 4,258,578. Floated, Internally Gimballed Platform Assembly. Filed June 6, 1978. Patented Mar. 31, 1981. Not available NTIS.

Patent 4,259,362. Process for Improving Baking Properties of Unbleached Flour. Filed Jan. 19, 1979. Patented Mar. 31, 1981. Not available NTIS.

Patent 4,259,834. Synchronized Flail for Treatment of Forestry Residues. Filed July 26, 1979. Patented Apr. 7, 1981. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health
Chief, Patent Branch
Westwood Building
Bethesda, Md. 20205

Patent 4,247,646. Laboratory Apparatus for Cloning Mammalian Cells. Filed Sept. 12, 1978. Patented Jan. 27, 1981. Not available NTIS.

Patent 4,255,386. Method and Apparatus for Destroying Organic Matter to Facilitate Trace Inorganic Element Analysis. Filed Nov. 30, 1978. Patented Mar. 10, 1981. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Director, Navy Patent Program/
Patent Counsel for the Navy
Office of Naval Research
Code 302
Arlington, Va. 22217

Patent application 6-171,567. Contrahelically Laid Torque Balanced Benthic Cable. Filed July 23, 1980.

Patent application 6-231,718. Constrained Store Ejector. Filed Feb. 5, 1981.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 25, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	4-29-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-25-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	7-11-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-03-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-31-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	6-08-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	11-01-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-06-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,139,622 to 3,142,840, inclusive

Plant Patents ..... Numbers 2,416 to 2,430, inclusive

REISSUES

SEPTEMBER 22, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

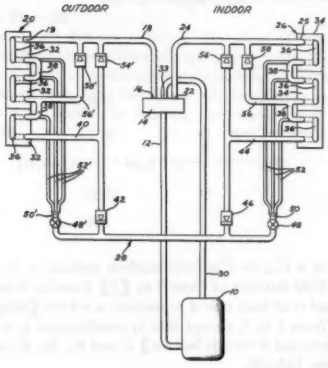
Re. 30,745
REVERSE CYCLE HEAT PUMP CIRCUIT

Leo B. Chambless, Norman, Okla., assignor to General Electric Company, Louisville, Ky.

Original No. 4,057,977, dated Nov. 15, 1977, Ser. No. 729,907, Oct. 6, 1976. Application for reissue Oct. 25, 1979, Ser. No. 85,436

Int. Cl.[3] **F25B** *13/00*

U.S. Cl. 62—324.1 **10 Claims**



6. A reversible refrigeration system adapted for heating and cooling, comprising:

a motor compressor unit;

an indoor heat exchanger and an outdoor heat exchanger each including a plurality of circuits, each circuit defining a single continuous passageway, a heat exchanger inlet line and a heat exchanger outlet line;

a valve for reversing the flow of refrigerant through said system to operate said system in a heating or cooling mode with each of said heat exchangers arranged interchangeably as a condenser or as an evaporator;

a conduit interconnecting said heat exchangers;

means connecting in series said single continuous passageways of each of the circuits in one of said heat exchangers arranged as a condenser to provide refrigerant flow successively through each of said single continuous passageway of each of said circuits between its heat exchanger inlet line and its outlet line when that heat exchanger operates as a condenser; and

means connecting in parallel said single continuous passageway of each of the circuits in said one of said heat exchangers when said one of said heat exchanger is arranged as an evaporator to provide refrigerant flow simultaneously through the continuous passageway of each of said circuits said conduit and said reversing valve when that heat exchanger operates as an evaporator.

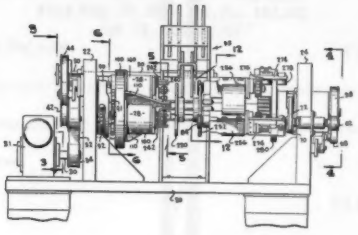
Re. 30,746
CAN CUTTING APPARATUS AND METHOD

Alphonse Stroobants, Lynchburg, and Daniel S. Cvacho, Forest, both of Va., assignors to Belgium Tool & Die Company, Lynchburg, Va.

Original No. 41,810,508, dated Jan. 1, 1980, Ser. No. 884,981, Mar. 9, 1978. Application for reissue May 14, 1980, Ser. No. 150,618

Int. Cl.[3] **B23B** *3/06, 3/04, 7/00*

U.S. Cl. 82—56 **18 Claims**



13. A can end trimmer comprising:

frame means;

a turret plate mounted for rotation about a horizontal axis on said frame means;

power means for rotating said rotary turret plate;

a plurality of cutter unit cartridges removably supported on one side of said turret plate;

each of said cutter unit cartridges including:

a housing having a head flange engaged with one side of said turret plate;

an axially fixed rotary knife shaft;

an axially fixed rotary knife mounted on said axially fixed rotary knife shaft;

a transversely shiftable rotary knife shaft having an axis parallel to said axially fixed rotary knife shaft;

a transversely shiftable rotary knife mounted on one end of said transversely shiftable rotary knife shaft;

shaft shifting means for moving said transversely shiftable rotary knife shaft to effect movement of said transversely shiftable knife into and out of cutting permitting engagement with said axially fixed rotary knife;

a rotary power input member; and

power transmission means connecting said rotary power input members to said knife shafts for effecting rotation of said knives in unison;

a vacuum chuck mounted on [said] *a* vacuum chuck supporting housing *opposite each of said cutter unit cartridges* for rotation about an axis parallel to the axis of rotation of said turret plate; and

means for reciprocating *each of* said vacuum [chuck] *chucks* toward its associated cutter unit cartridge to effect positioning of a can *held by said vacuum chuck* to be trimmed over said axially fixed cutter knife so that the axially fixed cutter knife is inside the can to be trimmed and for subsequently reciprocating the can away from the associated cutter unit following trimming of the can to effect the removal of the trimmed can from the cutter blade area.

Re. 30,747

ADHESIVE APPLICATOR CRAYONS

Janos A. Muszik, Dusseldorf, and Wolfgang Dierichs, Dusseldorf-Holthausen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Original No. 3,576,776, dated Apr. 27, 1971, Ser. No. 785,262, Dec. 19, 1968. Application for reissue Nov. 8, 1979, Ser. No. 92,376

Claims priority, application Austria, Feb. 1, 1968, 998/68

Int. Cl.[3] C09J *3/00, 3/14*

U.S. Cl. 260—22 R 11 Claims

1. An adhesive applicator crayon comprising a shape-giving base consisting of a gel of a gel-forming salt of an aliphatic carboxylic acid having from 8 to 36 carbon atoms with a cation selected from the group consisting of alkali metals, ammonia and lower alkylamines, in an aqueous liquid selected from the group consisting of water and mixtures of water with water-miscible organic solvents, with a content of from 5% to 40%, based on the total [amount of constituents in said crayon] *of the gel-forming substance, of the liquid components and of the adhesive substance*, of a film-forming adhesive component selected from the group consisting of water-soluble and water-dispersable adhesives.

Re. 30,748

PHOSPHATIDYL QUATERNARY AMMONIUM COMPOUNDS

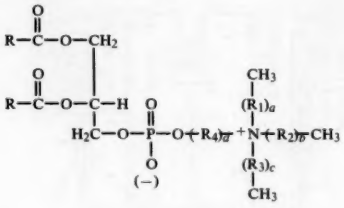
Barry D. Sears, 5 Cleveland Rd., Marblehead, Mass. 01945

Original No. 4,086,257, dated Apr. 25, 1978, Ser. No. 731,132, Oct. 12, 1976. Application for reissue Nov. 13, 1979, Ser. No. 93,631

Int. Cl.[3] A23J *7/00;* C07F *9/02*

U.S. Cl. 260—403 8 Claims

1. A synthetic phosphatidyl quaternary ammonium compound represented by the formula:



wherein R is a C_{14} to C_{20} hydrocarbon radical; a, b and c represent whole integers of from 0 to [3] *2 and a, b and c in total are equal to at least one*; d represents *a* whole [integers] *integer* of [from 1 to 5, except that in combination a, b and c cannot be zero and d cannot be two] *2;* and R_1, R_2, R_3 and R_4 are methylene radicals.

PLANT PATENTS

GRANTED SEPTEMBER 22, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,767

ROSE PLANT—73-3521

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Mar. 18, 1980, Ser. No. 131,393

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous tall bush, long stiff stems with few thorns, dark green, medium sized leaves, its uniform red flower color and light fragrance.

4,768

STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed May 27, 1980, Ser. No. 153,393

Int. Cl. A01H *5/03*

U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

PATENTS

GRANTED SEP. 22, 1981

ERRATA

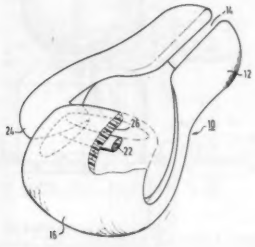
For CLASS	See PATENT NO.
411–002	4,290,337
411–021	4,290,338
411–185	4,290,469
501–013	4,290,813
501–107	4,290,814
560–076	4,291,127

PATENTS

GRANTED SEPTEMBER 22, 1981

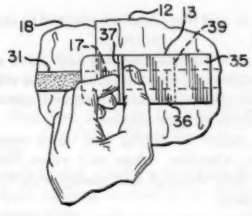
GENERAL AND MECHANICAL

4,290,147
HANDPROTECTOR FOR ATHLETES
Georg F. Brückner; Bernd Geike, both of Berlin; Fritz Berger, Ottobeuren, and Bernd-Jürgen Schoen, Grafenau, all of Fed. Rep. of Germany, assignors to Metzeler Schaum GmbH, Menningen, Fed. Rep. of Germany
Filed Nov. 5, 1979, Ser. No. 90,982
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847867
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—18 **7 Claims**



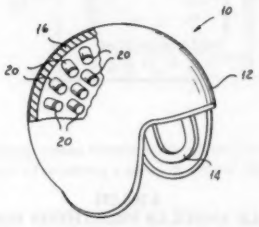
1. Handprotector for athletes, comprising a seamless one-piece protective cushion of soft and elastic polyurethane integral foam having a tubular forearm region surrounding the forearm and the wrist, said tubular forearm region having a narrow slit formed therein over the entire length thereof along the inside of the arm, a balloon-shaped hand region adjacent said forearm region, said hand region being bent back approximately 180° from the back of the hand in the vicinity of the fingertips to form the shape of a closed fist, a finger grip strap being integrably molded to said hand region and disposed exclusively on the inside thereof, and a protective thumb cover disposed adjacent said hand region and extending over the thumb at the side of said forearm region, said thumb cover being closed at the outer side and at least part of the inner side of the handprotector.

4,290,148
SURGICAL GOWN
Fred A. Roberts, 428 Beverly, Lake Forest, Ill. 60045
Filed Mar. 14, 1980, Ser. No. 130,230
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—51 **11 Claims**



1. A surgical gown comprising a body having sleeves attached thereto, said body having a central panel and first and second side panels, said body having inner tie strings for securing said gown about the waist of a wearer, fastening means for releasably securing said first side panel over said second side panel and tab means secured to an outer surface of said first side panel, said tab means having a grip portion extending out of the plane of said outer surface of said first side panel for easy contact and manual retention, said tab means being releasably secured to said outer surface for easy removal whereby a person may aid the wearer to don said surgical gown without contaminating the outer surface of said gown by tying said interior ties, grasping said grip portion of said tab means, pulling said first side portion over said second side portion to engage said fastening means by pulling said grip portion and removing said tab means from said gown.

4,290,149
METHOD OF MAKING AN INDIVIDUALLY FITTED HELMET
Jackson A. Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Continuation of Ser. No. 905,154, May 12, 1978, abandoned.
This application Feb. 11, 1980, Ser. No. 120,476
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—414 **9 Claims**

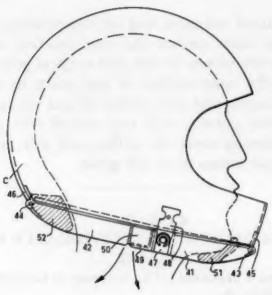


1. A method of making a custom-fitted helmet including the steps of assembling a perforated liner within a perforated fixture having the general configuration of a helmet outer shell with the liner perforations registering with the fixture perforations, assembling a plurality of elongated spacer plugs in said registering perforations with the major portions of the lengths of said spacer plugs outside said fixture, placing the assembly of said liner and said fixture and said plugs over the head of the intended wearer, pushing plugs located adjacent to the ends of the fore-and-aft median line and adjacent to the ends of the lateral median line and adjacent to the intersection of said median lines into engagement with the wearer's head properly to position said liner with reference to and to stabilize said assembly on the wearer's head, pushing the remaining spacer plugs into engagement with the wearer's head, removing said assembly from the wearer's head, removing the portions of said spacer plugs extending out from said fixture, removing said liner from the fixture, and securing said liner to a helmet shell.

4,290,150
PROTECTIVE HELMETS AND FASTENING DEVICES THEREFOR
Pierre Guerre-Berthelot, Lesigny, France, assignor to G P A International, Chevry Cossigny, France
Filed Oct. 30, 1978, Ser. No. 955,946
Claims priority, application France, Nov. 8, 1977, 77 33639; Jul. 13, 1978, 78 21002
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—421 **50 Claims**

1. Improved fastening device for securing a single piece helmet on the head, comprising essentially a rigid skirt extending completely around the base of the shell of the helmet and the lower part of a wearer's head in the region of the neck with the interposition of padding adapted to the lower part of the

head, said skirt being composed of two half-skirts hinged on the helmet at opposite points of said base, and two locking



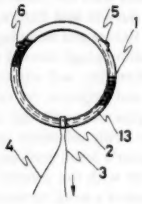
means and fixing means enabling said half-skirts to cooperate with the base of the shell of the helmet.

4,290,151

ADJUSTABLE ANNULAR PROSTHESIS FOR CARDIAC SURGERY

Miguel P. Massana, c/o Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017

Filed Jul. 22, 1980, Ser. No. 171,059
Claims priority, application Spain, Jul. 31, 1979, 244.903[U]
Int. Cl.³ A61F *1/22*
U.S. Cl. 3—1.5 **1 Claim**



1. An adjustable annular prosthesis for cardiac surgery comprising

a tubular body of textile material biocompatible with the human body, said tubular body being woven in such a manner that it is longitudinally and diametrically expandable, and the ends of said tubular body being sewn together at a seam to form a ring, and

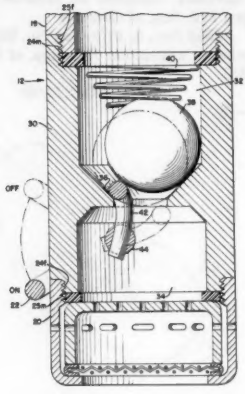
a filiform string provided in the interior of said tubular body and extending to the exterior thereof at two exit points on opposite sides of said seam so as to leave two loose ends, said string being undulated twice at approximately 130° from its respective exit points, extending to the exterior of the tubular body and then penetrating again into the interior thereof, thereby providing retention points of the string which differentiate zones of contraction during use of the prosthesis when the latter is sutured to an atrioventricular valve.

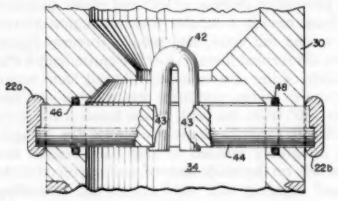
4,290,152

ON-OFF SNAP ACTION WATER AND ENERGY SAVING VALVE ATTACHMENT FOR SINK SPOUT

Joseph J. Kesselman, Sr., 16 Pont Street, New York, N.Y. 11021

Continuation-in-part of Ser. No. 948,788, Oct. 5, 1978, Pat. No. 4,181,987. This application Oct. 2, 1979, Ser. No. 81,065
Int. Cl.³ E03C *1/00, 1/086*
U.S. Cl. 4—191 **4 Claims**





1. An attachment for use between a sink spout and the non-splash aerator for said spout, said attachment comprising:

a casing having a generally longitudinal axis;

means, including a passageway along said longitudinal axis, for operatively connecting said sink spout to said non-splash aerator;

a partial partition across said passageway dividing said passageway into a first chamber and a second chamber;

the side of said partition closer to said spout defining a valve seat;

valve means in said first chamber adapted to seat against said valve seat;

spring means for normally biasing said valve means against said valve seat, whereby, when said valve means is seated, the said passageway is interrupted and water cannot flow from said spout to said aerator;

snap action means for lifting said valve means from said valve seat, whereby, when said valve means is lifted, water can flow through said passageway from said spout to said aerator;

said snap action means comprises a horizontally positioned shaft through said casing positioned below said valve seat;

said shaft having a cam surface located substantially centrally and having an operating surface in abutment with a bottom portion of the valve means whereby said valve means may be upset from said valve seat when in one mode and said shaft having a cam surface that permits the valve means to reside in said valve seat in another operative mode.

4,290,153

METHOD AND APPARATUS FOR GENERATING A CONTROLLED CURRENT FLOW AND WAVES IN A WATER POOL

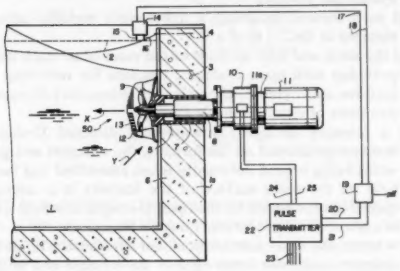
Erhard Kockerols, Bad Soden, and Albert Sagemüller, Gütersloh, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG

Filed Apr. 17, 1979, Ser. No. 30,940

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1978, 2816756

Int. Cl.³ A47K *3/10*; E04H *3/18*; E02B *3/00*

U.S. Cl. 4—491 **7 Claims**



1. An apparatus for generating a control current flow in a pool, comprising, a continuously operable electric motor having a rotatable drive shaft, an electrically operated clutch connected to said drive shaft, a rotatable propeller drive shaft disposed adjacent said clutch and being engageable with said clutch upon actuation of said clutch, a propeller affixed to said drive shaft for rotation therewith, mounting means rotatably supporting said drive shaft so that said propeller is disposed in said pool below the water level thereof, sensor means for sensing variations in the water level of the pool connected to said clutch for electrically actuating said clutch to selectively engage said clutch with said propeller drive shaft to drive said propeller to produce a current flow in said pool and to subsequently disengage said clutch from said drive shaft, said sensor means including a sensor having electrodes disposed substantially at the level of the surface of the liquid in the pool, a pulse delay connected to said sensor and a pulse transmitter connected between said pulse delay and said clutch for actuating said clutch after a delay.

4,290,154

BATHTUB STRUCTURE

William H. Benjamin, Bellflower, Calif., assignor to Benjamin Manufacturing Company, Inc., Paramount, Calif.

Filed Nov. 13, 1979, Ser. No. 93,889

Int. Cl.³ A47K *3/02, 3/16*

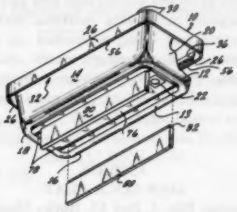
U.S. Cl. 4—538 **12 Claims**

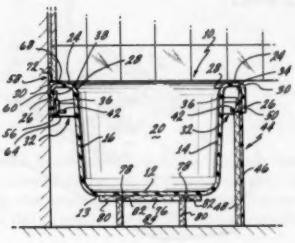
1. In a bathtub having a bottom integrally formed with four sides and a drain opening located in the bottom an improvement which comprises:

a smooth, continuous horizontally extending essentially planar surface integrally formed with and extending outwardly from each of the four sides;

a skirt member extending downwardly for a portion of the vertical height of the sides from the outer perimeter of said planar surface around said sides of said tub;

the uppermost portion of said walls, said planar surface and said skirt together forming a downwardly opening channel extending around the periphery of the uppermost portion of said walls;





a panel retaining means located in its entirety in said channel and capable of retaining a panel in a fixed alignment with said tub.

4,290,155

ARTICULATED BED

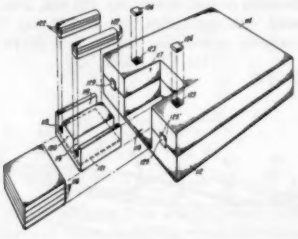
Paul B. Hanson, 2761 Eastwood Dr., Decatur, Ga. 30032

Continuation of Ser. No. 710,597, Aug. 2, 1976, Pat. No. 4,122,567, which is a continuation-in-part of Ser. No. 702,022, Jul. 2, 1976, Pat. No. 4,086,673, which is a division of Ser. No. 533,980, Dec. 18, 1974, Pat. No. 3,991,428, which is a continuation of Ser. No. 406,567, Oct. 15, 1973, abandoned. This application Oct. 26, 1978, Ser. No. 955,019

The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.

Int. Cl.³ A47C *27/00*

U.S. Cl. 5—465 **3 Claims**



1. An improved articulated bed, comprising:

(a) a main mattress support having generally flat top and bottom surfaces and a first rectangular cavity disposed in one of its ends, said main mattress support having portions thereof on opposite sides of said first cavity;

(b) a main mattress on said top surface and having a second rectangular cavity disposed along one of its ends in registry with said first cavity, said main mattress having portions thereof on opposite sides of said second cavity;

(c) a rectangular removable support means generally corresponding in dimensions and shape to said first cavity and removeably received within said first cavity; and

(d) a rectangular removable mattress means within said second cavity and being supported on said removable support means, said support means and said mattress means being selectively removable from the respective cavities to facilitate use of said main mattress and said cavities for sexual intercourse.

4,290,156

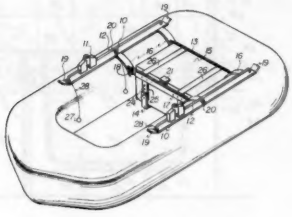
OAR LOCK SEAT

Darwin B. Rawson, Rte. 1, Box 11, Butte, Mont. 59701

Filed Aug. 9, 1979, Ser. No. 65,043

Int. Cl.[3] B63B *17/00, 29/00*

U.S. Cl. 9—1.1 **8 Claims**



1. An oar lock seat device for use in inflatable rafts and the like comprising:

a left and right oar lock assembly means disposed on the top portions of the gunwales of the raft,

transverse structural bars disposed in longitudinally spaced relationship within the upper portion of said raft and having opposite ends detachably connected to a respective one of said left and right oar lock assembly means,

seat carriage bracket means extending from said transverse structural bars downwardly from and between said transverse structural bars within the interior of said raft to define with said transverse structural bars a recess for slidably accommodating a cooler seat box upon which an oarsman sits.

4,290,157

COLLAPSIBLE BOAT

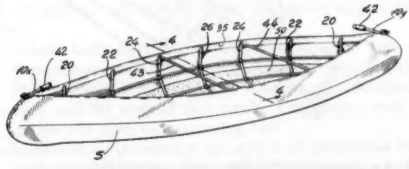
Ragnar Jensen, Jr., Sundlia 6A, N-1315 Nesöya, Norway

Continuation-in-part of Ser. No. 912,866, Jun. 5, 1978, abandoned. This application Feb. 8, 1979, Ser. No. 10,360

Claims priority, application Canada, Sep. 24, 1976, 262026

Int. Cl.[3] B63B *7/00*

U.S. Cl. 9—2 C **8 Claims**



1. A collapsible boat comprising a skeleton and water-impervious skin held in tension against the skeleton, the skelton comprising:

(a) a longitudinal main beam terminating in upwardly curved bow and stern sections,

(b) a pair of gunwale members and a plurality of stringers extending from the stern to the bow section, and

(c) a plurality of formers extending laterally of the beam and spaced apart longitudinally,

(d) each of the gunwales, stringers and main beam being assembled from a plurality of lightweight metallic tubular sections,

(e) each section having one end retainably inserted into the other end of the next section making up the gunwale, stringer and beam,

(f) the ends of each gunwale and stringer on one side of the longitudinal beam being connected to the end of the corresponding gunwale and stringer on the other side of the beam by individual connectors each having at least a stub cylindrical portion,

(g) each former including a lightweight metallic tubular member in the form of a U,

(h) the stern and bow sections of the main beam each being provided with open C-shaped brackets for receiving respective stub cylindrical portions of connectors of respective pairs of stringers and gunwales,

(i) a plurality of open, downwardly directed U-shaped brackets positioned on the formers, the stringers and gunwales being bowed outwardly when assembled and being held on the outer surface of the formers in a laterally spaced-apart relation by the open U-shaped brackets fixed at corresponding locations on each former,

(j) wherein the skin under tension over the skeleton holds the stringers and main beam against the formers and within the open U-shaped brackets.

4,290,158

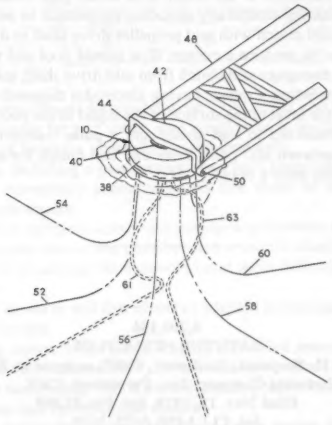
MOORING BUOY

Francis A. Kuntz, Jr., San Pedro, Calif., assignor to Amtel, Inc., Providence, R.I.

Continuation of Ser. No. 784,132, Apr. 4, 1977, abandoned. This application Jan. 28, 1980, Ser. No. 116,098

Int. Cl.[3] B63B *21/52*

U.S. Cl. 9—8 P **3 Claims**



2. In a mooring system for a ship wherein a yoke is used to couple the ship to a buoy of the mooring system, the improvement comprising:

a U-shaped member;

means mounted on the top of said buoy, for supporting said U-shaped member for rotation about a vertical axis extending through the center of said buoy, and with the arms of said U-shaped member extending downwardly on either side of said buoy to be freely rotatable therearound; and

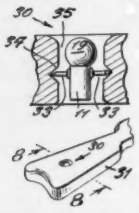
means for pivotably coupling said yoke to the arms of said U-shaped member.

4,290,159

SPORTSMAN'S RETRIEVER

Charles I. McLennan, Goochland; Marshall G. Stokes, Richmond, both of Va., and George J. Konucik, P.O. Box 9482, Richmond, Va. 23228, assignors to George Joseph Konucik, Richmond, Va.

Filed Dec. 26, 1979, Ser. No. 107,335
Int. Cl.³ B63C *7/26*
U.S. Cl. 9—9 **1 Claim**



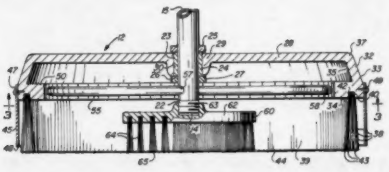
1. A sportsman's retriever, comprising, in combination, a can, a line wound on a spool retained inside said can, one end of said line being attached to said spool, and an opposite end of said line being attached to a float temporarily attached to said can by a water-soluble adhesive; said retriever including a means to allow the retriever to be mounted, and to swivel within an opening through a piece of equipment, such as a fishing pole handle or a gun stock, so that the float end of the retriever pivots to be above the spool end at all times, thus permitting the float to move freely toward the surface of the water.

4,290,160

ROTARY BRUSH

Larry K. Daniels, deceased, late of Flagstaff, Ariz., and Patricia K. Daniels, administratrix, Flagstaff, Ariz.

Filed Jan. 21, 1980, Ser. No. 113,634
Int. Cl.³ A46B *13/06*
U.S. Cl. 15—29 **10 Claims**



1. A rotary brush for use with a source of pressurized fluid and for utilizing said fluid for wetting and scrubbing a surface, said rotary brush comprising:

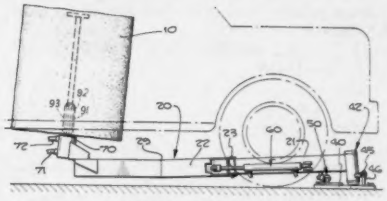
a. an elongate handle member including
   i. an inlet end,
   ii. a discharge end, and
   iii. a fluid passage communicating between said ends;
b. connection means carried at the inlet end of said handle means for connection to said source of pressurized fluid;
c. a rotor assembly including
   i. a generally circular spatter shield extending radially from said handle member,
   ii. a generally cylindrical movable brush element terminating with a scrubbing face generally parallel to said shield,
   iii. a skirt coaxially encircling said movable brush element and having a terminal edge proximate said scrubbing face, and
   iv. a circumferential row of spaced apart inwardly directed impeller blades;
d. nozzle means communicating with said fluid passage for impinging said pressurized upon said impeller blades to urge rotation of said rotor assembly;
e. mounting means for rotatably securing said rotor assembly proximate the discharge end of said handle member.

4,290,161

AUTOMATED CARWASH BRUSH ASSEMBLY

Ronald G. Fishering, and Peter M. Fishering, both of 1344 Primrose Ave., Rialto, Calif. 92376

Filed Jun. 20, 1979, Ser. No. 50,185
Int. Cl.³ B60S *3/06*
U.S. Cl. 15—53 AB **15 Claims**



1. An improved brush assembly for a carwash having a rotating brush mounted at the end of an arm member, the arm member moving the brush to various locations along a car passing through the carwash, the improvement comprising:

a base;

an arm member comprising a single arm assembly comprising an inside and an outside arm pivotally mounted with respect to each other at an intermediate pivot; and

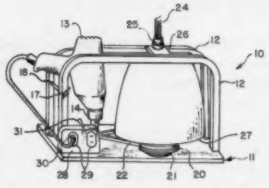
support means extending upward from the base at an angle to the vertical and attached to the end of the inside arm assembly opposite the intermediate pivot for pivotally mounting the arm assembly above the base so that the arm assembly pivots in a near horizontal plane above and adjacent the base, the brush extending upward from the arm member.

4,290,162

LIGHT-WEIGHT FLOOR-STANDING DRAIN CLEANER

Michael Agostino, 2558 Yates Ave., Bronx, N.Y. 10469

Continuation-in-part of Ser. No. 56,298, Jul. 10, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 139,985
Int. Cl.³ B08B *9/02*
U.S. Cl. 15—104.3 SN **7 Claims**



1. A light-weight portable floor-standing drain cleaner comprising a frame, said frame including a pair of adjacent spaced apart members, a first pulley rotatably mounted on said frame, a second pulley rotatably mounted on said frame, a drive belt, said drive belt connected between said first and second pulley, said first pulley including a free pulley shaft, said members including means to removably fix a hand drill with its chuck engaged with said first pulley shaft, a hollow rounded drum, said drum including an inner portion and an outer portion, said inner and outer portions closely spaced, said inner portion having a rounded top, said outer portion including an opening at its top, said outer portion including an integral hollow spin-

dle extending from said opening, said spindle rotatably mounted between said members, said drum rotatably mounted on said second pulley, and a cleaning cable, said cable slidable through said spindle and adapted to coil within said drum.

4,290,163

ARRANGEMENT FOR REMOVAL OF RESIDUES AND SEDIMENTS FROM THE INTERIOR SURFACES OF BARRELS OF WEAPONS

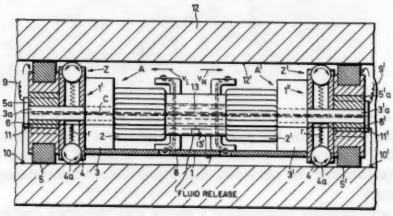
Rigobert Opitz, Habichtswald, and Juergen Flach, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 74,040

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839153

Int. Cl.[3] **F41F** *17/14;* **A46B** *13/02*

U.S. Cl. 15—104.09 **3 Claims**



1. An automatic axially reciprocally movable cleaning arrangement for removing residues and sediments from cylindrical bores and in particular gun barrels, wherein said arrangement includes a carrier with at least one drive motor having electrical energy supply means connected thereto and electrical switching means connected to the electrical energy supply means for reversing the rotation of said at least one drive motor, and a container for holding cleaning fluid mounted on the carrier, and rotary brush means operatively connected to said motor, the improvement comprising in combination,

a. the rotary brush means being rotated about the longitudinal axis of the gun barrel;

b. drive gear means operatively connected on the one hand to said at least one drive motor and, on the other hand, to said rotary brush means;

c. centering means operatively mounted on said carriers and including a plurality of drive rollers which are continuously biased against the inner surface of the gun barrel; and

d. said drive rollers of said centering means being rotated by said drive motor to axially advance said cleaning arrangement in said gun barrel.

4,290,164

ADAPTOR FOR CONNECTING A WIPER BLADE TO A WIPER ARM

Johan H. van den Berg, Hasselt, Belgium, assignor to Archambel, S.A., Brussels, Belgium

Filed Oct. 10, 1979, Ser. No. 83,511

Claims priority, application France, Nov. 15, 1978, 78 32252

Int. Cl.[3] **B60S** *1/40*

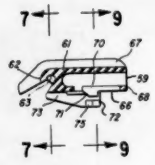
U.S. Cl. 15—250.32 **17 Claims**

1. An adaptor between a wiper blade **(43)** and two hook-shaped wiper arm ends **(41,42)**, comprising an elongate body **(61,161,261,361)** which fits exactly into the inside of each of the two hooks **(45,50)** of said wiper arm ends **(41,42)** and is capable of being mounted on a rivet **(44)** of said wiper blade **(43)**, characterized in that said adaptor also comprises:

(a) first blocking means **(63,163,263,363)** located at the front end portion **(62,162,262,362)** of the adaptor **(60,160,260,360)** and permitting the snap-fitting of said device onto said rivet **(44)**,

(b) second blocking means **(70,170,270,372)** attached to the rear end portion **(59,159,259,359)** of the adaptor **(60,160,260,360)** and which cooperate with a first type of hook-shaped arm end **(41)** in order to prevent any displacement of said first-type arm end **(41)** with respect to said adaptor,

(c) third blocking means **(72,172,272,372)** carried by the



lower portion of the adaptor **(60,160,260, 360)** and which cooperate with a second type of hook-shaped arm end **(42)** in order to prevent any displacement of said second type arm end **(42)** with respect to said adaptor, wherein the elongate body **(61,161,261)** of the adaptor is hollow over most of its length, and comprises two lateral side walls **(67,167,267)** which project from said body **(61,161,261)** and wherein said second **(70,170,270)** and third **(72,172,272)** blocking means are attached to said lateral side walls **(67,167,267)**.

4,290,165

COLLECTING APPARATUS

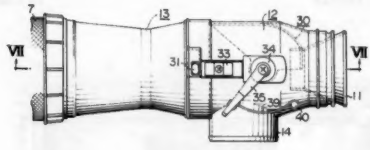
Kenzo Hiramatsu, Hoya, and Fumihiko Aiyama, Musashino, both of Japan, assignors to Kioritz Corporation, Japan

Filed Feb. 12, 1980, Ser. No. 120,600

Claims priority, application Japan, Aug. 13, 1979, 54-110473[U]

Int. Cl.[3] **A47L** *5/18*

U.S. Cl. 15—330 **4 Claims**



1. A hand-carried apparatus selectively operable as an air sweeper for blowing to gather or scatter seeds, dust, snow, or the like or as a suction device for collecting fruit, dirt, or other objects, said apparatus comprising in combination:

a. a sleeve having an upstream end and a downstream end;

b. a nozzle extending into said sleeve at the upstream end thereof, said nozzle being connected to means for supplying air under pressure thereto, which air in turn may be directed as a jet flow into said sleeve;

c. a passage, including a restricted portion, extending from the downstream end of said sleeve;

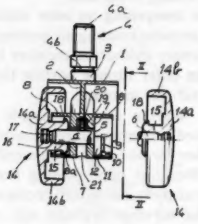
d. a tubular member intersecting said sleeve at one side thereof and communicating with the space inside said sleeve;

e. valve means disposed within said sleeve adjacent said nozzle and being selectively switchable to a position for permitting said jet flow to pass through said passage and restricted portion to effect vacuum condition in said sleeve and to another position for deflecting said jet flow to pass directly into and through said tubular member to effect a blowing condition at the end of said tubular member spaced from said sleeve.

4,290,166
SELF-ALIGNING TWIN-WHEELED CASTER

Francescantonio Melara, Via Ferrarese, 8, Bologna, Italy

Filed Jun. 19, 1979, Ser. No. 50,035
Claims priority, application Italy, Jun. 26, 1978, 3480 A/78
Int. Cl.³ A47B 91/00
U.S. Cl. 16—47 2 Claims

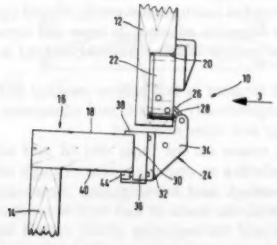


1. A self-aligning twin-wheeled caster of a type comprising a vertical wall, a seat formed through said wall perpendicularly thereto elongated in a vertical direction and defining tubular front projections on both sides of said wall, a shaft carried in said seat and having its opposite ends extending outwardly from said seat on both sides thereof, a pair of wheels rotatably secured to said opposite ends and having tubular hub portions provided with outer collars facing said projections, a sleeve formed in said wall and contained in the same plane as said wall and perpendicular and offset with respect to said seat, a rotatably carried pin in said sleeve adapted for insertion into a vertical housing of the article whereto the caster is mounted, front bushings defined on both sides of said wall and arranged coaxial with said seat such as to receive said hub portions provided with collars, wherein according to the improvement the castor further comprises a hole formed in said wall and intersecting said seat, elastic means arranged in said hole and acting on said shaft to bring said hub portions in sliding contact with lower portions of said bushings, teeth contoured over an arc of a circle internally and at the lower half of said bushings, and close to the free ends of said bushings, said teeth defining respective shoulders adapted for snap engagement behind said collars for axially retaining said wheels.

4,290,167
HINGE FOR FURNITURE PIECES WITH A FRAME EXTENDING INTO THE DOOR OPENING

Horst Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Mepla Inc., High Point, N.C.

Filed Jan. 17, 1980, Ser. No. 112,814
Int. Cl.³ E05D 7/04
U.S. Cl. 16—129 11 Claims

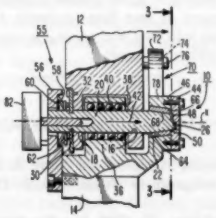


1. An articulated hinge for pivotally connecting a door leaf to a carcass of a furniture piece having a carcass wall and a frame protruding at right angles from said carcass wall and having a front face, and a rear face substantially parallel to said front face, said frame having an end face defining an unobstructed door opening of the furniture piece, said end face extending substantially at right angles to said front and rear faces, and having a relatively narrow width between said front and rear faces, and its major longitudinal extension perpendicular to said width, said front face in the closed position of the door leaf being covered at least in part by the door leaf; said hinge having a carcass-related mounting part adapted to be adjustably mounted to the frame, and a door-related mounting part adapted to be mounted at the door leaf and pivotally connected via a link mechanism with said carcass-related mounting part so as to be pivotable about an axis extending parallel to said longitudinal extension when mounted to said frame, said carcass-related mounting part comprising a flange plate for holding said link mechanism and adapted to be detachably connected to the end face, said flange plate having at least one through bore for at least one connecting screw to be screwed into the end face; an adjustment plate on that side of the flange plate which faces the frame end face when mounted thereto, said adjustment plate being displaceable by a predetermined amount relative to the flange plate in the direction of said longitudinal extension, said adjustment plate, in the area below said at least one bore being provided with an oblong hole extending in the direction of displacement of the adjustment plate relative to the flange plate, surfaces of the flange plate and the adjustment plate facing each other being provided with at least one pair of complementary ramp surfaces each extending in the direction of said longitudinal extension and inclined with respect to said pivot axis of said link mechanism, said surfaces upon displacement of the adjustment plate relative to the flange plate sliding on each other, to thereby effect a change in the distance of the flange plate from the frame end face when mounted thereto and thereby a corresponding change of the amount of overlap of the frame by the door leaf.

4,290,168
HINGE CONSTRUCTION WITH POSITIVE LOCKING MEANS

Derek S. Binge, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1979, Ser. No. 84,587
Int. Cl.³ E05D 1/06, 7/10
U.S. Cl. 16—175 15 Claims



1. A hinge joint construction comprising:

a first hinge member,

a second hinge member secured to the first member, said second member being rotatable about a pivot axis relative to the first member and axially moveable relative to the first member in a first direction parallel to the axis,

friction locking means including detent means and friction means each having engaged and disengaged states, said locking means being coupled to said members for locking said members in a fixed relative angular position only when said first member is in a first relative position along said axis with respect to said second member to thereby place said detent and friction means in the engaged state; said locking means including said friction means and said detent means both being disengaged only when said first

member is in a second relative axial position along said axis with respect to said second member, and

axial positioning means for axially placing said first member in said first axial position from said first position only when said hinge members are in said fixed angular position.

4,290,169

APPARATUS FOR FORMING A FIBER STRAND INTO CYCLOIDAL LOOPS

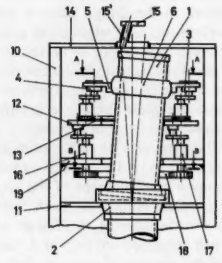
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneva, Switzerland

Filed Nov. 27, 1979, Ser. No. 97,892

Claims priority, application Switzerland, Dec. 19, 1978, 12871/78

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—159 R **6 Claims**



1. Apparatus for continuously taking up a ropelike strand of fibers from a card or drawing frame and loading it into a receiving container in cycloidal loops, comprising a tube inclined from the vertical with its upper end below a sliver guide and is lower end supported such that the tube can move about its lower end, first eccentric drive means coupled to said tube for imparting thereto a gyratory movement such as would cause the tube to move in a generally conical path about its lower end, and second eccentric drive means coupled to said first eccentric drive means to impart to said first eccentric drive means a gyratory movement such that the gyratory movement of said second eccentric drive means is superimposed on the gyratory movement of said first eccentric drive means, and means for driving said first and second eccentric drive means at respectively different speeds.

4,290,170

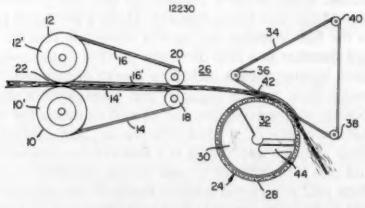
DEVICE FOR ALIGNING THE ATTENUATING FIBER MATS

David S. Brookstein, Marietta, and Alton R. Colcord, Atlanta, both of Ga., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,639

Int. Cl.³ D01H *5/26, 5/74*

U.S. Cl. 19—236 **5 Claims**



1. In a device for aligning and attenuating fiber mats wherein the mats are fed through a series of roller nips, each one of which is driven at a faster speed than a preceding one in the series of roller nips, the improvement whereby relatively soft or brittle fiber mats can be aligned and attenuated without seriously affecting the fiber length distribution, said improvement comprising in combination:

at least one preceding roller nip;

a vacuum roller comprising an inner stationary cylindrical member and an outer rotating air-permeable tubular member, said stationary cylindrical member forming a vacuum chamber in an outer surface portion thereof adjacent to said rotating tubular member;

a continuously moving air-impermeable flexible element which is located in contiguous relationship to said rotating tubular member forming therewith a roller nip adapted to receive the fiber mat upon passing from the preceding roller nip and also extending into contact with the portion of said tubular member opposite said vacuum chamber whereby upon application of a vacuum to said chamber said flexible element exerts a compressive force against said fiber mat which is sufficient to hold the mat in relative fixed position against said tubular member but without breaking or damaging the fiber mat; and

means for rotating said tubular member at a rate of speed which will impart to the fiber mat a faster linear rate of speed than that at which the mat passes through the preceding roller nip.

4,290,171

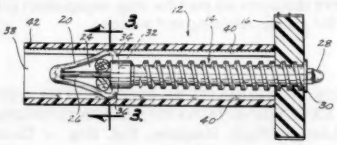
CLAMPING DEVICE

Fred F. Wilcox, 1506 Beaver Ave., Des Moines, Iowa 50310

Filed Mar. 14, 1979, Ser. No. 20,254

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—18 **11 Claims**



1. A clamping device comprising,

a length of line having opposite ends,

an elongated hollow member having inner and outer ends and oppositely disposed sidewalls,

said hollow member having transversely aligned openings in its opposite sidewalls adjacent its inner end through both of which the ends of said line moveably extend in opposite directions,

an adjustment member in said hollow member and adapted to move longitudinally thereof, said adjustment member having inner and outer ends, and

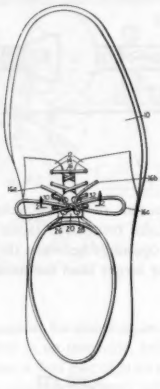
line-engaging means on the inner end of said adjustment member including an opening means through which said line ends extend, said line-engaging means adapted to cooperate with the inside of said hollow member to lock said line to said line-engaging means as said adjustment member is moved outwardly in said hollow member by the edges of said openings and the side-walls of said hollow member doubling the line back upon its self on opposite sides of side line-engaging means thereby tightening said line about an article being clamped between said line and the inner end of said hollow member.

4,290,172

KNOT RETAINER FOR SHOELACES

Gary B. Burton, 2617 SW. Water St., Portland, Oreg. 97201

Filed Feb. 15, 1980, Ser. No. 121,743
Int. Cl.[3] F16G *11/00*; A43C *9/00*
U.S. Cl. 24—117 3 Claims



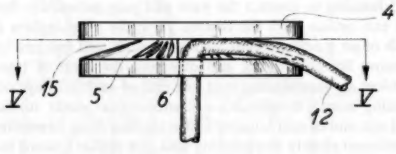
1. A knot retainer for shoelaces comprising
(a) a disc-like body member having upper and lower surfaces and also having outer defining edges,
(b) said body member being arranged to lie flat on the lacing area of a shoe,
(c) first aperture means extending through said body member within the outer defining edges thereof arranged to receive upwardly therethrough both the free ends of a shoelace to be tied,
(d) said body member being arranged to support a bow knot in the shoelaces on the upper surface thereof in the area of said first aperture means,
(e) and a pair of second apertures extending through said body member within the outer defining edges thereof on opposite sides of said first aperture means and arranged to receive downwardly therethrough the respective free ends of the shoelace after a knot has been tied on the upper surface of said body member.

4,290,173

METHOD AND MEANS FOR RELEASABLE SECURING OF STRINGS

Henrik Herlau, 27 Vaeldegaardsvej, 2820Gentofte, Denmark

Filed Sep. 13, 1978, Ser. No. 941,905
Int. Cl.[3] F16G *11/04*
U.S. Cl. 24—118 1 Claim



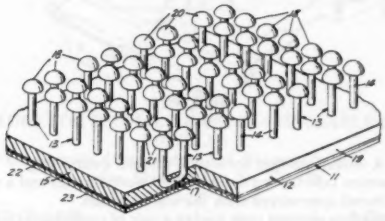
1. A fastening device for strings, comprising upper and lower disks disposed in mutual juxtaposition and having adjacent flat and frustoconical surfaces respectively, the smaller diameter planar end surface of said lower disk being coaxially secured to the flat surface of said upper disk, so that the region between said disks defines a circumferential string retaining wedge, a string receiving groove extending across a diameter of said lower disk, and at least one string-receiving hole normal to the smaller diameter planar end surface of said lower disk and extending through the larger diameter end surface thereof and communicating with said string-receiving groove.

4,290,174

SEPARABLE FASTENER AND ARTICLE FOR MAKING SAME

Melvin O. Kalleberg, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 714,132, Aug. 13, 1976, abandoned.
This application Jan. 13, 1978, Ser. No. 869,132
Int. Cl.[3] A44B *18/00*
U.S. Cl. 24—204 12 Claims



1. A fastener comprising two articles adapted for releasable engagement, each of said articles comprising:
a backing comprising a uniform non-fibrous non-oriented polymeric surface bonding layer having an exposed major surface;
a multiplicity of flexible resilient generally U-shaped generally identical monofilaments of longitudinally oriented polymeric material, each including:
a central bight portion embedded in, bonded in, and held only by said bonding layer:
two stem portions extending from the opposite ends of said bight portion and projecting generally normal to said exposed major surface of the surface bonding layer, and having unsupported ends opposite said bight portion; and
an enlarged generally circular head at each unsupported end, each of the heads being generally concentric with its supporting stem portion and having a cam surface opposite its supporting stem portion adapted for engagement with the cam surface on the heads of the other article to produce side deflection of the heads upon movement of said heads toward each other with the backings of said articles generally parallel;
the bight portions of said U-shaped monofilaments being disposed generally parallel with a plurality of groups of the bight portions each being disposed generally side by side to form a plurality of generally parallel rows of stem portions with said heads along and between the rows being spaced at distances which, as an average, are generally no greater than the diameter of the heads so that simultaneous movement of all the heads of the articles past each other can occur only upon resilient separation of many of said heads, with said stems being spaced apart a distance which, as an average, is at least as large as the diameter of said heads to afford positioning of the heads of each article between the stems of the other, and with the length of each stem portion from the major surface to the head on its unsupported end being at least equal to the diameter of the head to afford deflection of the stems to allow simultaneous movement of all the heads of said articles past each other at any relative angular orientation between the rows of stems of said articles.

4,290,175

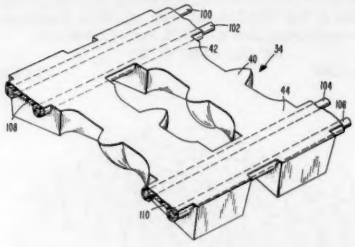
SLIDE FASTENER WITH MOLDED ELEMENTS AND METHOD OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 817,718, Jul. 21, 1977, which is a continuation-in-part of Ser. No. 724,223, Sep. 17, 1976, abandoned. This application Mar. 22, 1979, Ser. No. 22,900

Int. Cl.³ A44B *19/30*

U.S. Cl. 24—205.13 D **3 Claims**



1. A woven stringer for a slide fastener comprising

a woven tape having a plurality of warp threads and a weft thread interwoven with the warp threads,

a coupling element train having a pair of connecting threads and a plurality of spaced polymer coupling elements molded on the connecting threads,

each of said coupling elements having a head portion and a pair of leg portions extending in generally the same direction from opposite sides of the head portion,

said connecting threads each having spaced embedded segments which are embedded in the leg portions on respective sides of the coupling elements and having spaced connecting segments which extend between adjacent leg portions on respective sides of the coupling elements to join the coupling elements together,

a plurality of reinforcing means including a plurality of projections molded integral with the coupling elements and extending partially across the spaces between adjacent coupling elements on respective sides of the coupling elements to reinforce all of the connecting segments,

said plurality of projections including two projections extending from each coupling element in opposite directions from respective leg portions of each coupling element,

said plurality of projections extending from the respective leg portions between the connecting threads and the heels of the leg portions and being slightly spaced from the connecting threads,

said weft thread having a plurality of loops on one longitudinal edge of the tape,

both connecting segments and reinforcing means in each space between adjacent coupling elements being encircled together by at least one loop of the plurality of loops to secure the train to the one edge of the tape and to hold the pair of leg portions of each coupling element together, and

a protrusion on each projection between the connecting thread and each projection for a portion of the length of each projection.

4,290,176

SLIDE FASTENER AND METHOD OF MAKING SAME

Helmut Wulz, Birmensdorf, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

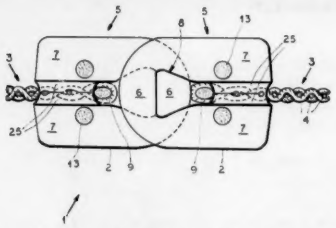
Filed Feb. 29, 1980, Ser. No. 125,783

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907954

Int. Cl.³ A44B *19/40*

U.S. Cl. 24—205.16 R **10 Claims**

1. A slide fastener stringer comprising a pair of slide fastener halves each provided with a fabric support tape having a longitudinal edge and consisting of synthetic resin strands forming mesh openings, and a row of U-shaped coupling members straddling said edge and interdigitable with the coupling members of the other slide fastener half, said coupling members each having a pair of shanks welded together through mesh openings of the respective tapes located between the shanks, said mesh openings between the shanks of each coupling member being larger than the mesh openings elsewhere of sai tapes.



4,290,177

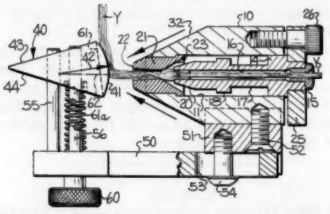
AIR JET WITH A BAFFLE INCLUDING AN ARCUATE YARN ENGAGING SURFACE

Samuel T. Price, Kennett Square, and Kay P. Hoffsommer, Ridley Park, both of Pa., assignors to Enterprise Machine and Development Corp., New Castle, Del.

Filed Oct. 24, 1979, Ser. No. 87,729

Int. Cl.³ D02G *1/16*

U.S. Cl. 28—254 **5 Claims**

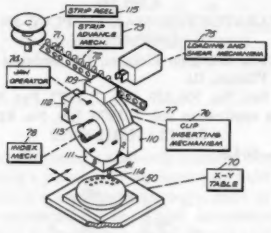


1. In an air jet for treating multifilament yarn and including an elongate housing having a central bore therethrough, an entrance end for passage of yarn into said air jet, an exit end including an exit orifice for passage of yarn from said air jet, and means for directing pressurized air into the central bore of said housing to contact the yarn and pass outwardly through the exit orifice with the treated yarn; the combination therewith of air guiding means associated with said exit end of said housing for controlling and directing the path of travel of ambient air surrounding said exit end of said housing, said air guiding means comprising a frusto-conical outer surface on said exit end of said housing and extending from its smaller end positioned closely surrounding said exit orifice toward its base positioned between said exit orifice and said entrance end of said housing so that the pressurized air leaving said exit orifice causes the ambient air surrounding said exit end of said housing to be drawn downwardly along said frusto-conical outer surface and join the pressurized air and yarn leaving said exit orifice of said air jet, and including a baffle spaced from said exit orifice, said baffle comprising an arcuate leading surface positioned to be engaged by the yarn and pressurized air after leaving said exit orifice, and a substantially wedge-shaped portion extending away from said arcuate leading surface.

4,290,178
ASSEMBLY APPARATUS FOR ELECTRICAL CONNECTORS

Egon F. Friese, Tustin, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 10, 1978, Ser. No. 904,602
Int. Cl.[3] B23P *19/04, 23/04*
U.S. Cl. 29—33 M 8 Claims

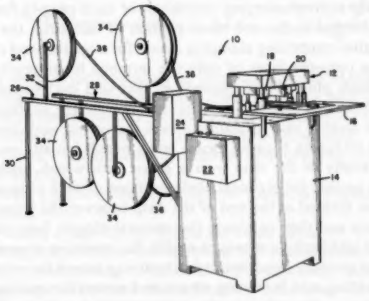


1. An automated assembler for inserting an electrical contact retention clip into a hole in an insulator, said assembler comprising: a carrier member; a first pair of jaws movably mounted on said member; a jaw operator mounted and actuable to open said first jaws and deactuable to close said first jaws; a reciprocable mechanism actuable to load a clip in between said first jaws when they are open, said first jaws, when closed, forming a cavity to fit snugly around a clip; a plunger slidable in the said cavity of said first jaws; first means for actuating said jaw operator to open said first jaws; second means for actuating said mechanism to load a clip between said first jaws; third means to reciprocate said plunger to eject a clip from the first jaws and insert it into the insulator; fourth means to operate said third means, said second means and said first means in synchronism to cause said first jaws to open before the clip is loaded, to cause said first jaws to close on the clip after the clip has been loaded, and to reciprocate said plunger to eject the clip from the first jaws after the clip has been loaded and the first jaws closed.

4,290,179
CABLE HARNESS ASSEMBLY MACHINE

Johannes C. W. Bakermans, and Richard A. Neiman, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 22, 1979, Ser. No. 86,927
Int. Cl.[3] B25B *11/02;* H01R *43/04*
U.S. Cl. 29—33 M 14 Claims



1. A machine for the manufacture of electrical cable harnesses by gang crimping terminals to one or both ends of multi-conductor flat flexible cable in a single operation, said machine comprising:

a press assembly defining a work station;

at least one multi-terminal applicator mounted in said work station so as to be actuated by said press;

means to feed a continuous supply of terminals in strip form to each said at least one multi-terminal applicator; and

a cable hold down assembly for each said at least one multi-terminal applicator, said cable hold down assembly being mounted for reciprocal movement into and out of said applicator and comprising a vacuum hold down member, an edge guide adjustably mounted on said member, and an end abutment pivotally mounted on said member.

4,290,180
FIXTURE FOR SPECIAL GEARS, PARTICULARLY OF BICYCLES

Tullio Campagnolo, Corso Padova 168, Vicenza, Italy

Filed Mar. 10, 1980, Ser. No. 128,478
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—240 3 Claims

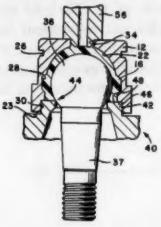
1. An apparatus for mounting and removing special gears, particularly for mounting sprocket wheels on and removing them from the free-wheel units of bicycles, comprising a first tool in the form of an appropriately shaped elongated metal plate, having a smooth handgrip and a functional part provided with a plurality of recesses which are shaped to receive and mate with elements of a free-wheel unit so as to prevent their rotation, each of said recesses being provided at the centre with a screw-threaded hole, said first tool comprising at least two locking pin members apt to be screwed into said screw-threaded holes and to lock in said recesses of the plate the elements of the free-wheel unit having to be handled; and a second tool of the type comprising a handle, provided at one end with a half-moon shaped body having a length of bicycle transmission chain pivotally connected to one end thereof, characterized in that, the recesses in said first tool are apt to mate not only with the outer profile of the free-wheel unit elements having to be applied to the tool, but also with the wall of the inner hole of said elements, and in that, said second tool comprises, in order to engage the sprocket wheels of said free-wheel unit, on one hand a transmission chain length and, on the other hand, a pair of chain links mounted so as to form an articulated parallelogram.

4,290,181

BALL JOINT FORMING METHOD AND APPARATUS THEREFOR

Robert W. Jackson, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 22, 1979, Ser. No. 87,597
Int. Cl.³ B23P *25/00*
U.S. Cl. 29—458 **1 Claim**



1. A method of constructing a ball joint comprising the steps of:

forming an open-ended ball-receiving cavity in a housing;

inserting a ball with a stud projecting therefrom through said open end of said cavity and into said cavity to a position in which the ball cooperates with the wall of the cavity to define a chamber therebetween and in which the stud projects away from the housing;

engaging said ball and said housing with a fixture to control the dimension of said chamber, said fixture including a shoulder extending from said ball to said housing;

injecting a pressurized plastic bearing material into said chamber to engage said plastic bearing material with said fixture shoulder and completely fill said chamber;

allowing said plastic bearing material to congeal in said chamber with the ball in contact with the bearing material;

rotating said ball on said fixture as said bearing material congeals while maintaining said bearing material under pressure;

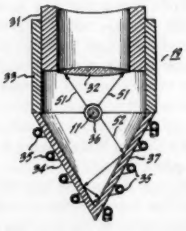
attaching a retaining ring to said housing adjacent said open end of said cavity to retain said ball and said bearing material within said cavity.

4,290,182

METHODS AND APPARATUS FOR MEASURING THE TEMPERATURE OF A CONTINUOUSLY MOVING STRAND OF MATERIAL

Hopeton S. Lawrence, Lawrenceville, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Oct. 3, 1979, Ser. No. 81,603
Int. Cl.³ B22D *11/126*; G01J *5/00*
U.S. Cl. 29—527.4 **10 Claims**



6. A method of measuring the temperature of an article, comprising the steps of:

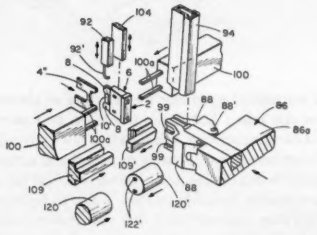
positioning an article within a radiation absorbing cone; and measuring the thermal radiation emitted from the article with a thermal radiation measuring device positioned proximate the base of the cone to determine the temperature of the article.

4,290,183

APPARATUS FOR MAKING PLUG-IN FUSE ASSEMBLIES

Robert J. Tait, Arlington Heights, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Division of Ser. No. 766,239, Feb. 7, 1977, Pat. No. 4,099,322.
This application Jul. 7, 1978, Ser. No. 922,880
Int. Cl.³ H01H *69/02*
U.S. Cl. 29—564.8 **6 Claims**



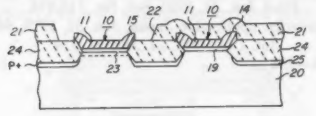
1. In combination with apparatus for making a plug-in fuse element including a plate-like body of fuse metal having a pair of spaced confronting generally parallel terminal blade portions to be received by pressure clip terminals or the like, current-carrying extensions at the inner ends of said pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions at the inner ends of said pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, said apparatus comprising means for receiving a strip of fuse metal having longitudinally spaced blank portions from which individual plug-in fuse elements are to be formed, such means including means for sequentially advancing the strip of fuse metal, and means for blanking said strip in each of said sequentially advanced blank portions to form a plug-in fuse element therein comprising said pair of terminal blade portions and current-carrying extensions interconnected by said fuse link portion, the improvement comprising apparatus for forming from said blanked portions of the strip separated individual insulated plug-in fuse elements where the insulation is provided by insulating means applied over the current-carrying extensions of each plug-in fuse element formed in the end blank portion of said strip, the latter apparatus comprising clamping means for engaging and clamping the opposite faces of only the terminal blade portions of each such plug-in fuse element so that said current-carrying extensions and fuse link portion are completely exposed and free to receive said insulating means thereover, said clamping means including backing means and a punch initially movable transversely of the strip over a given path which brings the punch against the terminal blade portions of each plug-in fuse element formed at the end of the strip to sever the same from the strip and then to clamp the severed plug-in fuse element against said backing means to enable the insulation means to be applied over the same, insulation applying means for receiving and holding said insulating means and means for moving said insulating unit applying means for applying said insulating means over the current-carrying extensions of each such plug-in fuse element while said clamping means remains in clamping relation with the terminal blade portions thereof.

4,290,184

METHOD OF MAKING POST-METAL PROGRAMMABLE MOS READ ONLY MEMORY

Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 20, 1978, Ser. No. 890,555
Int. Cl.³ G11C *11/40;* H01L *7/44, 27/10;* B01J *17/00*
U.S. Cl. 29—571 **16 Claims**



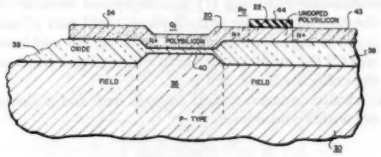
1. A method of making a read-only memory comprising the steps of: forming a plurality of insulated gate field effect transistors in a face of a semiconductor body, each of the transistors having a source, a drain and a gate, the transistors being in a regular pattern to provide an array of rows and columns of memory cells, the sources of all transistors in each column being integral with and connected in common to elongated column lines in said face, and drains of all transistors in each column being integral with and connected in common to elongated column lines in said face, the column lines including heavily-doped semiconductor material in said face, the gates of all transistors in each row being connected to a row line; the column lines running generally perpendicular to the row lines, one overlying the other; and thereafter programming the array of memory cells by masked ion implant penetrating through the gates and into the semiconductor body for selected ones of the field effect transistors but not through metal conductors on said face.

4,290,185

METHOD OF MAKING AN EXTREMELY LOW CURRENT LOAD DEVICE FOR INTEGRATED CIRCUIT

Vernon G. McKenny, and Tsiu C. Chan, both of Carrollton, Tex., assignors to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 957,587, Nov. 3, 1978, Pat. No. 4,251,876, which is a continuation of Ser. No. 743,810, Nov. 22, 1976, abandoned. This application May 29, 1979, Ser. No. 43,420
Int. Cl.³ H01L *21/00*
U.S. Cl. 29—571 **5 Claims**



1. A method for producing an integrated circuit of the type including an insulated gate field effect transistor and a load impedance device for conducting current from a power supply node through the channel of the transistor comprising:

providing a semiconductor substrate chip of a first conductivity type;

growing a layer of thermal oxide on the surface of the substrate;

depositing a layer of nitride on the oxide layer;

forming a mask over the combined nitride and oxide layers and photoresisting to define an active area and a field area;

removing the layer of nitride from the field area;

implanting ion impurities of the first conductivity type in the field area;

removing the photoresist from the active area;

growing a layer of thermal oxide over the field area;

removing the nitride and oxide layers over the active area;

growing a layer of gate oxide over the active area;

depositing a layer of undoped semiconductor material over the gate oxide;

masking and photoresisting the undoped semiconductor layer to define a gate strip having a gate interconnect portion;

depositing a diffusion-impervious layer over the undoped gate interconnect portion;

masking and photoresisting the diffusion-impervious layer to define the situs of a potential extremely low current load impedance device;

removing the oxide layer from the active area to define the situs of drain and source regions;

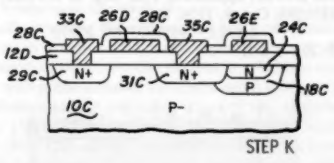
diffusing impurities of the opposite conductivity type into the unmasked portions of the undoped semiconductor layer and into the active area, whereby a diffused gate and diffused source and drain regions are formed by the diffusion of impurities into gate strip and into the active area of the substrate on either side of the gate strip, a nondiffused channel region being defined in the active area beneath the gate oxide and gate strip, and an intrinsic-extrinsic junction being formed in the gate interconnect at the interface of the undoped semiconductor material beneath the mask with the adjacent impurity diffusion.

4,290,186

METHOD OF MAKING INTEGRATED SEMICONDUCTOR STRUCTURE HAVING AN MOS AND A CAPACITOR DEVICE

Thomas Klein; Andrew G. Varadi, and Charles E. Boettcher, all of Saratoga, Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Continuation of Ser. No. 788,872, Apr. 19, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,637
Int. Cl.³ B01J *17/00;* H01L *21/265*
U.S. Cl. 29—576 B **11 Claims**



1. A method for making an integrated semiconductor structure having an MOS semiconductor device and a semiconductor capacitor device comprising the steps of:

forming a semiconductor region of one conductivity type within a higher resistivity semiconductor substrate region of the same type conductivity,

forming a shallow semiconductor region of opposite conductivity type within said semiconductor region of one conductivity type located within said higher resistivity semiconductor substrate region of the same one type conductivity, forming an insulating layer on a surface of said semiconductor region of one conductivity type, said higher resistivity semiconductor substrate region of the same one type conductivity, and said shallow semiconductor region of opposite conductivity type, ,

forming spaced polysilicon layer portions on the surface of said insulating layer over said shallow semiconductor region of opposite conductivity type and over a portion of said higher resistivity semiconductor substrate region of said one conductivity type spaced from said shallow semiconductor region of opposite conductivity type to be used as a self-aligned polysilicon gate electrode for the MOS semiconductor device,

forming openings in said insulating layer on opposite sides of

said polysilicon gate electrode layer portion for subsequently forming source and drain regions,

forming source and drain regions for the MOS semiconductor device on opposite sides of said polysilicon gate electrode layer portion using said polysilicon gate electrode layer portion as a self-aligned mask which is doped during the step of forming said source and drain regions along with said polysilicon layer portion located over said shallow semiconductor region of opposite conductivity type to render both said polysilicon layer portions electrically conductive,

said electrically conductive polysilicon layer portion located over said shallow semiconductor region of opposite conductivity type being one plate of the semiconductor capacitor device, the portion of said insulating layer located over said region of opposite conductivity type being the dielectric of said semiconductor capacitor device, and said region of opposite conductivity type being the other plate of said semiconductor capacitor device.

4,290,187

METHOD OF MAKING CHARGE-COUPLED ARRANGEMENT IN THE TWO-PHASE TECHNIQUE

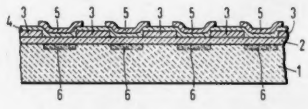
Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 863,526, Dec. 22, 1977, abandoned, which is a division of Ser. No. 696,745, Jun. 16, 1976, abandoned, which is a continuation of Ser. No. 513,350, Oct. 9, 1974. This application Jul. 25, 1979, Ser. No. 60,376

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1973, 2351393; Oct. 9, 1974, 513350

Int. Cl.[3] **H01L** *13/00, 27/10*

U.S. Cl. 29—576 B **1 Claim**



1. A method of producing a charge-coupled arrangement in two-phase technique, comprising two series of cooperable spaced electrodes with the spaced electrodes of one series overlying spaces between the electrodes of the other series, said method comprising the steps of applying a layer of insulating material to a substrate of semiconductor material, applying to said insulating layer a plurality of electrodes comprising one of said series and disposed in spaced sequential relation on such layer, utilizing said electrodes as masking members and introducing doping atoms by means of ion implantation into said semiconductor material between said electrodes, whereby said semiconductor material is provided with more highly doped zones of a same conductivity type as the substrate spanning the space gaps between such series of electrodes, applying, at least to said electrodes, a second layer of insulating material, and applying to the structure so formed further electrodes, comprising the other of said series, with the latter electrodes extending into said space gaps between the electrodes of said first series, in complete insulated relation with respect thereto, and overlying said more highly doped zones in insulated relation with respect to said zones.

4,290,188

PROCESS FOR PRODUCING BIPOLAR SEMICONDUCTOR DEVICE UTILIZING PREDEPOSITION OF DOPANT AND A POLYCRYSTALLINE SILICON-GOLD FILM FOLLOWED BY SIMULTANEOUS DIFFUSION

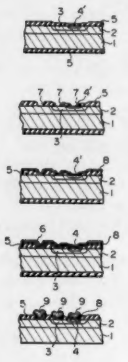
Yoshito Ichinose, Kawasaki; Takeshi Fukuda, Tokyo, and Naoaki Kobayashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 30, 1980, Ser. No. 116,974

Claims priority, application Japan, Jan. 31, 1979, 54/10032

Int. Cl.[3] **H01L** *21/283, 21/324*

U.S. Cl. 29—591 **10 Claims**



1. A process for manufacturing a bipolar semiconductor device comprising the steps of:

forming an epitaxial layer on a silicon wafer, said epitaxial layer comprising a collector layer of said device;

forming a base layer of said device by diffusion of impurities having one conductivity type in a portion of said epitaxial layer within said collector layer;

depositing an inpurity of the opposite conductivity type on a part of said base layer;

selectively depositing polycrystalline silicon on the entire surface of said wafer to provide windows for emitter, base and collector electrodes of said device,

applying a gold-containing film on the entire surface of the polycrystalline silicon layer;

simultaneously driving (1) said deposited impurity having the opposite conductivity type into said part of said base layer so as to form an emitter layer within said base layer and (2) the atoms of said gold through said windows into the collector layer; and

electrically connecting said emitter, base and collector layers within said device.

4,290,189

METHOD OF FABRICATING A LOW COST DIAGONAL TYPE MHD GENERATOR CHANNEL FRAME ELEMENT

Anthony P. Coppa, Merion, Pa., assignor to General Electric Co., Fairfield, Conn.

Filed Dec. 26, 1979, Ser. No. 106,810

Int. Cl.[3] **H02K** *15/00*

U.S. Cl. 29—596 **9 Claims**

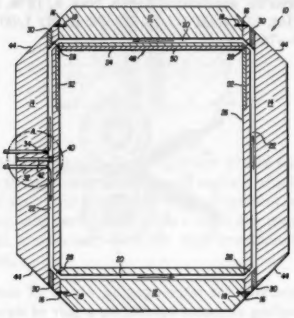
1. A method of fabricating a diagonal type MHD generator channel frame element, comprising the steps of:

forming a first set of members each of which has a first predetermined exterior cross-sectional profile, and a passageway, formed as a result of said forming process, totally enclosed within said first member and having a predetermined cross-sectional profile similar to said exterior cross-sectional profile of said first member;

forming a second set of members each of which has a second

predetermined exterior cross-sectional profile different from said first predetermined exterior cross-sectional profile, and a passageway, formed as a result of said forming process, totally enclosed within said second member and having a predetermined cross-sectional profile similar to said exterior cross-sectional profile of said second member;

connecting said first and second members together in an annular array so as to define said frame element, with members of each set disposed in opposite pairs;



fluidically connecting together said passageways defined within said first and second members such that a single fluid passageway extends throughout said annular frame element; and

connecting a fluid circulatory means to said single fluid passageway so as to circulate coolant fluid within said single passageway and throughout said annular frame element.

4,290,190

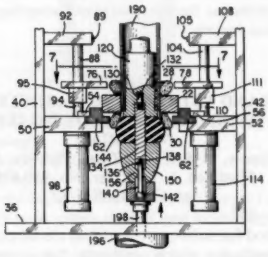
METHOD AND APPARATUS FOR SPREADING STATOR WINDINGS

Richard B. Arnold, Fort Wayne, Ind., assignor to Advanced Machine and Tool Corporation, Fort Wayne, Ind.

Filed Feb. 25, 1980, Ser. No. 124,323

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—596 **13 Claims**



1. Stator winding spreading apparatus comprising:

first means for releasably clamping a stator having a cylindrical opening at a work station;

said stator having windings at least partially covering one end of said opening;

a resilient cylindrical plug;

a tubular cylindrical sleeve having a smooth surfaced outer wall and having an outside diameter that provides a sliding bit with said opening and an inside diameter that provides a sliding fit with said plug;

second means for moving said sleeve axially of said plug to a first axial position to cover said plug and withdrawing said sleeve to a second axial position to uncover said plug;

third means for inserting said plug covered by said sleeve axially into the other end of said stator opening to an axial position whereat said plug is radially opposite said windings;

fourth means to axially compress said plug whereby when said third means has inserted said sleeve and plug into said opening and said second means has withdrawn said sleeve, said fourth means compresses said plug to cause it to radially expand and force said windings radially outwardly to uncover said opening.

4,290,191

METHOD FOR MAKING A COMMUTATOR FOR AN ELECTRIC MOTOR

Otto Klein, Wemding, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

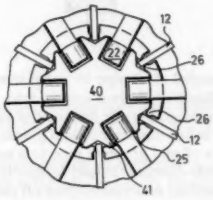
Division of Ser. No. 883,870, Mar. 6, 1978, Pat. No. 4,180,900.

This application Aug. 20, 1979, Ser. No. 68,107

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709433

Int. Cl.³ H01R *43/06*

U.S. Cl. 29—597 **7 Claims**



1. The method of manufacturing a commutator for an electric motor comprising the steps of:

individually inserting the segments of said commutator into a cavity in a mould intermediary plate in a circular arrangement substantially that desired in a finished commutator, with predetermined circumferential spaces between the adjacent axially extending edges of said segments;

inserting a radially inwardly directed removable separating web within each of said circumferential spaces from outside the periphery of said cavity and between said adjacent axially extending edges of said segments;

inserting a tool along the axial centerline of said arrangement of segments to inelastically deform at least one of the adjacent edges of each adjacent pair of said segments against the corresponding separating web in a manner reducing said circumferential spaces between said adjacent segment edges and said supporting webs at least at their radially inward edges;

and admitting a plastic moulding material into the cavity within said arrangement of segments to form a monolithic commutator assembly, said segment deformation tending to preclude entry of said plastic moulding material into said predetermined circumferential spaces especially near the outer surface of said finished commutator.

4,290,192

METHOD OF MAKING A SODIUM SULFUR BATTERY

Perry E. Elkins, Santa Ana, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1979, Ser. No. 105,848

Int. Cl.³ H01M *10/38, 10/39*

U.S. Cl. 29—623.5 **3 Claims**

1. A method of making a sodium sulfur battery which comprises:

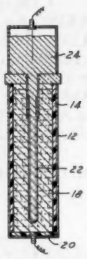
selecting a steel pipe having a predetermined inside diameter;

selecting a porous graphite pipe having an outside diameter greater than said predetermined inside diameter of said steel pipe;

machining said outside diameter of said graphite pipe to a diameter in the range of 0.005 inches to 0.010 inches greater than said predetermined inside diameter of said steel pipe;

heating said steel pipe so as to expand the same so that the inside diameter is greater than said predetermined inside diameter when in a heated condition;

slipping said heated steel pipe over said machined graphite pipe;



cooling said heated steel pipe to room temperature so that the inside diameter thereof comes into intimate contact with said machined outside diameter of said graphite pipe;

machining the inside diameter of said graphite pipe to reduce the thickness of said graphite pipe to a selected thickness;

coating the inside diameter of said relatively porous graphite pipe with a sealant material to close off the porosity of said graphite pipe from the internal diameter thereof thereby forming a portion of the sodium sulfur battery container; and

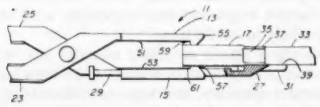
providing the container with cathodic reactant material, sodium electrolyte material and a sodium anode compartment so as to form said sodium sulfur battery.

4,290,193

CONNECTOR EXTRACTOR TOOL

John J. Anderton, Oil City, and Lynette E. Graham, Titusville, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 19, 1979, Ser. No. 105,188
Int. Cl.[3] H01R *43/00*
U.S. Cl. 29—764 **3 Claims**



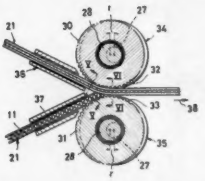
1. An extractor tool for removing a connector of the type having a latch for releasably fastening the connector to a support member, said tool comprising first and second connector gripping members mounted for movement toward and away from one another in a given direction, means for normally biasing said connector gripping members in the open position, hand actuated means operably associated with said connector gripping members for moving said members to a clamping position against the force of said biasing means, a latch engaging member mounted on at least one of said gripping members for movement in a direction substantially normal to the given direction, said latch engaging member having a wedge shaped end for engaging and releasing said connector from said support member when said gripping members are in a clamping position and said latch engaging member is moved toward said latch.

4,290,194

APPARATUS FOR INTERENGAGING OPPOSED ROWS OF SLIDE FASTENER COUPLING ELEMENTS

Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 1, 1979, Ser. No. 90,136
Claims priority, application Japan, Nov. 6, 1978, 53-136551
Int. Cl.[3] B23P *11/00, 19/04;* B29D *5/00*
U.S. Cl. 29—766 **4 Claims**



1. An apparatus for interengaging a pair of rows of slide fastener coupling elements carried on a pair of stringer tapes, respectively, said apparatus comprising;

(a) a pair of non-rotatably supported parallel spaced first and second shafts, each of said first and second shafts having first and second portions eccentric to each other;

(b) a pair of guide wheels each rotatably mounted on said second portion of one of said first and second shafts and having a plurality of peripheral teeth meshable with one of unengaged rows of coupling elements for guiding the same and for regulating distances between adjacent coupling elements of the last-named one of unengaged rows; and

(c) a pair of presser rollers each rotatably mounted on said first portion of one of said first and second shafts for squeezing the unengaged rows of coupling elements to interengage the same immediately after the latter are released from said peripheral teeth of said guide wheels, whereby the pair of rows of coupling elements can be interengaged without obstruction or impairment by said peripheral teeth of said guide wheels but while such regulated distances between adjacent coupling elements of each row remain.

4,290,195

METHODS AND ARTICLES FOR MAKING ELECTRICAL CIRCUIT CONNECTIONS EMPLOYING COMPOSITION MATERIAL

Ralph E. Rippere, 4145 W. Banff La., Phoenix, Ariz. 85023

Filed Sep. 1, 1978, Ser. No. 938,878
Int. Cl.[3] H05K *3/32*
U.S. Cl. 29—837 **33 Claims**

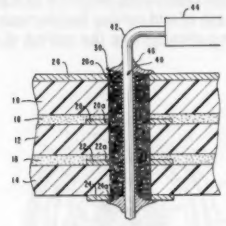
1. A method for making an electrical circuit connection to at least one conductor which conductor has an exposed surface defining in part an at least partially enclosed space, said method comprising the steps of:

(a) loading discrete composition particles into said space, said composition particles each comprising first and second electrically conductive components, said second component having a lower melting point than said first component and said second component having less than a 10 to 100 ratio by weight to said first component in said particles to avoid becoming a lubricant upon melting of said second component;

(b) asserting pressure to said composition particles to contact said exposed surface of said conductor with said composi-

tion particles and to achieve a coherent unit which resists the sagging of either of said first and second components under the force of gravity upon the melting of only said second component;

(c) heating said particles to melt only said second component



sufficiently to allow at least a portion of said second component to flow onto said exposed surface of said conductor and yet avoid sag of said first component; and

(d) cooling said particles to form a rigid electrical and mechanical connection between said conductor and said compact.

4,290,196

APPARATUS FOR CUTTING FOODSTUFFS

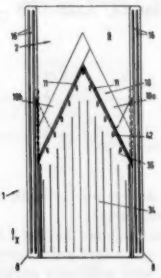
Alfred Börner, Industriegebiet, 5561 Niederkail, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,956

Claims priority, application United Kingdom, May 30, 1978, 24588/78

Int. Cl.³ B26B *3/00*

U.S. Cl. 36—122 **7 Claims**



1. Apparatus for cutting foodstuffs upon linear movement thereof comprising:

(a) a substantially flat body comprising;

(i) a support plate,

(ii) a fixed cutting blade secured to the support plate, lying generally in the plane thereof, and extending across said plate,

(b) first substantially flat plate means comprising:

(i) plural upstanding cutting blades projecting from the plane thereof, and

(ii) guide means at the edges thereof,

(c) means for supporting said first plate means in spaced, substantially parallel relationship to said support plate with said upstanding cutting blades in the said space and in planes transverse to the plane of said fixed cuting blade,

(d) second substantially flat plate means comprising:

(i) side edges engaging said guide means of said first plate means,

(ii) plural upstanding cutting blades projecting from the plane thereof in the said space, and in planes transverse to the plane of said fixed cutting blade and intermediate the planes of said cutting blades of said first plate means,

(e) whereby to cut foodstuffs into strips.

4,290,197

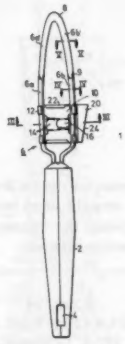
HAND-UTENSIL PARTICULARLY USEFUL FOR REMOVING THE PEEL OF CITRUS FRUIT

Shlomo Zaroor, 105 Krinitzi St., Ramat Gan, Israel

Filed Mar. 25, 1980, Ser. No. 133,822

Int. Cl.³ A47J *17/04*

U.S. Cl. 30—123.7 **4 Claims**



1. A hand utensil particularly useful for removing the peel of oranges or other citrus fruit characterized in that it includes:

a handle;

a blade-like member having an inner end fixed to said handle and extending substantially axially thereof, and an outer curved tip;

and a curved cutting element secured to said blade-like member adjacent to the handle at an axis substantially perpendicular to that of the handle, such that the curved cutting elements may first be used for removing a central circumferential strip of the citrus peel, after which the blade-like member may be inserted between the fruit and its remaining peel on both sides of the removed strip for removing said remaining peel;

said blade-like member being constituted of a pair of parallel, spaced rod-shaped arms converging together at said outer curved tip;

said curved cutting element being formed in a transversely extending strip fixed between said parallel spaced arms by being pressed outwardly from a section of said strip;

and said transversely extending strip further including an extension laterally of said curved cutting element and having a straight edge for facilitating removing any remaining fragments of the fruit peel.

4,290,198

ICE BREAKER

Robert A. Richards, North Adams, Mass., assignor to Janice M. B. Richards, North Adams, Mass., a part interest

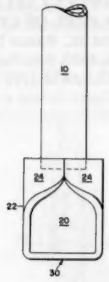
Filed Apr. 7, 1980, Ser. No. 138,180

Int. Cl.³ E01H *5/12*

U.S. Cl. 30—164.5 **1 Claim**

1. A tool for chopping and breaking ice comprising, a plate having a straight sided intermediate portion of substantially square configuration having a straight chamferred lower edge for providing the chopping and breaking function, a pair of arcuate supporting portions projecting rearwardly from each side edge of the intermediate portion, the supporting portions having a curvilinear configuration so as to extend not only rearwardly but also inwardly with the end edges of the two supporting portions being brought into osculation with each

other, each supporting portion additionally being provided with a taper which extends downwardly from its outboard free terminus to its line of joinder with the respective side edge of the intermediate portion with the lower edges of the arcuate



portions serving to pressurize the ice and to force it forwardly in the direction of the straight sided intermediate portion, and a handle disposed between the intermediate portion and the arcuate portions and welded thereto.

4,290,199

CUTTING APPARATUS FOR A RUSTY NUT

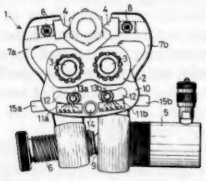
Shuji Hashimoto, No. 197-1, Uchihashi, Kasuya-Cho, Kasuya-District, Fukuoka-Pref., Japan

Filed Nov. 2, 1979, Ser. No. 90,775

Claims priority, application Japan, Sep. 26, 1979, 54-132050[U]

Int. Cl.³ B26B *17/00*

U.S. Cl. 30—180 **6 Claims**



1. An apparatus for cutting a rusty nut comprising

(A) a pair of arms coupled in opposing position by a pair of axes,

(B) a pair of cutting blades, each blade affixed to a top inside portion of one of the pair of arms,

(C) a pressure mechanism positioned at an end of at least one of the pair of arms,

(D) a plate situated on the pair of axes,

(E) at least one pair of springs situated between the pair of arms and connected through a coupling member on the plate, said springs actuated separately from one another to equalize balance of movement of said pair of arms, and

(F) a member on the surface of the plate for indicating the balance between the pair of arms.

4,290,200

APPARATUS FOR CUTTING VEGETATION

Marco H. Lombard, Austin, Tex., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 29, 1979, Ser. No. 53,592

Int. Cl.³ A01D *50/00*

U.S. Cl. 30—276 **26 Claims**

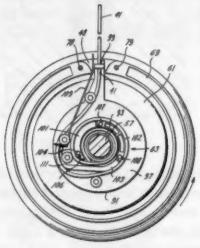
1. An apparatus for cutting vegetation, comprising:

(a) a head rotatable about an axis of rotation and said head having at least one peripheral aperture;

(b) said head carrying a supply of cutting line;

(c) said cutting line being flexible and non-metallic with a free end extending outwardly from said head through said aperture into a cutting plane;

(d) cam means for controlling extension to a predetermined maximum length of said cutting line through said aperture into the cutting plane during the cutting of vegetation;



(e) said cam means including unitary gripping members adapted for progressively gripping said cutting line proportionately to its length extending into the cutting plane; and

(f) said gripping members modulated by vibration of said cutting line into a pulsing gripping of said cutting line whereby dynamic friction conditions predominate between the said gripping members and said cutting line.

4,290,201

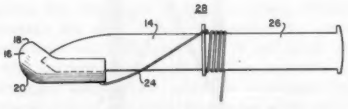
FIELD DRESSING DEVICE

Joseph Goodwin, R.D. #4, Box 430-C, Jackson, N.J. 08527

Filed Sep. 12, 1979, Ser. No. 74,732

Int. Cl.³ A22B *5/16*

U.S. Cl. 30—294 **6 Claims**



1. A field dressing device for use with a knife incising the hide of an animal, comprising:

a generally elongated member having a rearwardly extending body portion and a forwardly extending nose portion adjacent thereto, with said body portion having a slot to receive at least the leading edge of the non-cutting surface of the blade of a knife to be held in place thereby and the tip thereof, and with said nose portion having a generally rounded contour extending forwardly of the tip of said knife blade, including a top surface extending upwardly beyond said knife blade tip and a bottom surface extending downwardly beneath said tip; and

wherein the top surface of said nose portion extends upwardly with respect to said knife blade tip by an amount sufficient to deflect away from the incision the hide of an animal as said knife blade is pushed forward along the length of cut desired.

4,290,202

CHAIN SAW GUARD

Glenn L. Nadenoff, 1074 Lynsue La., Pontiac, Mich. 48054

Filed Mar. 24, 1980, Ser. No. 132,899

Int. Cl.³ B27B *17/00*

U.S. Cl. 30—382 **10 Claims**

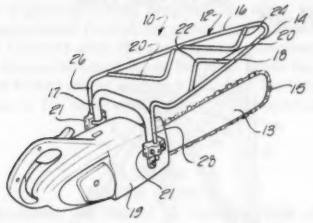
1. A detachable and adjustable chain saw guard for attach-

ment to a chain saw having an extended saw bar around which the saw chain is driven by a motor, said motor being supported in a motor housing having a handle, said guard comprising:

first and second elongated rods;

a first means for connecting said rods together at one end such that the rods define a space therebetween;

a second means for releasably connecting the free ends of said rods to a chain saw such that the rods extend above and along the saw bar and saw chain; and



a plurality of inwardly tapering projections, each projection being secured to at least one of said rods and extending from and between said rods substantially within the plane of said rods and wherein said projections are interspersed from side to side to thereby form an interdigital substantially planar frame structure above the saw bar and saw chain.

4,290,203

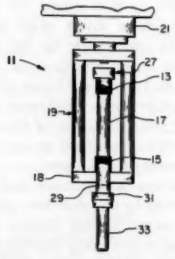
INSERTION COMPLIANCE DEVICE

Jack Rebman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Apr. 7, 1980, Ser. No. 138,065

Int. Cl.³ G01B *5/25*

U.S. Cl. 33—169 C **10 Claims**



1. An alignment apparatus for correcting axial and angular misalignment between first and second mating parts each having an insertion axis to permit assembly of said parts, comprising:

holding means operable to hold said first mating part for assembly with said second mating part; and

insertion means connected to said holding means, said insertion means including an intermediate member having a longitudinal axis colinear with said inseriton axis of said first mating part, a first compliance means attached to one end of said intermediate member, and a second compliance means attached to the other end of said intermediate member, said first and second compliance means and said intermediate member cooperating to permit translational and rotational motion of said first mating part in every plane passing through said insertion axis thereof for continuous axial and angular alignment of said mating parts to avoid binding, jamming and damage to said mating parts during assembly.

4,290,204

PLUG GAUGE FOR CHECKING INTERNAL GEOMETRIC DIMENSIONS

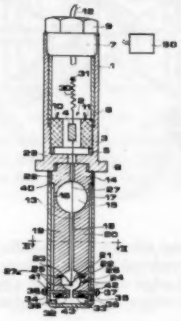
Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs, S.p.A., S. Marino di Bentivoglio, Italy

Filed Nov. 15, 1979, Ser. No. 94,727

Claims priority, application Italy, Dec. 1, 1978, 3612 A/78

Int. Cl.³ G01B *5/12, 7/12, 3/26*

U.S. Cl. 33—178 E **9 Claims**



1. Plug gauge for checking internal geometrical dimensions of bores of mechanical parts, comprising a supporting section, two members associated with said section and movable with respect to the same, two feelers adapted to contact the part to be checked, each feeler being coupled to a relevant movable member in such a way as to be movable substantially in a radial direction with respect to a longitudinal axis of the gauge, a position transducer, with a movable element, the transducer being adapted to provide a signal responsive to the position of the movable element, and connection means for connecting said movable element and said members, the connection means including a resilient lamina and supporting means for supporting the movable element, the supporting means being connected to the resilient lamina and arranged substantially in an axial direction of the gauge, wherein the supporting section and the movable members substantially comprise a single part including a base, corresponding to the supporting section, and a portion, adjacent to the base, with a longitudinal cut splitting this portion in two half-portions corresponding to said members; this single part having near the end of the longitudinal cut adjacent to the base two thin flexible sections acting as fulcrums to allow the displacement of the movable members with respect to the base, said resilient lamina being arranged between the half-portions, near the other end of the longitudinal cut.

4,290,205

RIM SURFACE MEASURING GUAGE FOR WHEEL BALANCES

Donald C. Holm, San Jose, Calif., assignor to Autotron Equipment Corporation, Mountain View, Calif.

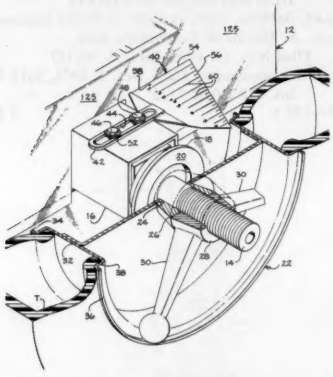
Filed Mar. 10, 1980, Ser. No. 128,945

Int. Cl.³ G01B *3/30, 3/02*

U.S. Cl. 33—180 R **6 Claims**

1. A gauge for ascertaining the location of the plane of the inner edge of a vehicle wheel rim on a wheel balancer of the type having a stationary base, a driven shaft journalled for rotation on a substantially horizontal axis on said base, a portion of said shaft extending outward of said base, and means on said shaft portion for securing a wheel rim thereon to be rotatively driven thereby, said gauge comprising a generally planar blade formed of flexible resilient material, said blade having an

edge and a plurality of visible indicia adjacent said edge for indicating distance in a linear direction, means for supporting said blade so that said linear direction is substantially parallel to said shaft, said blade supporting means affording movement of said blade in a direction transversely of said shaft so that said



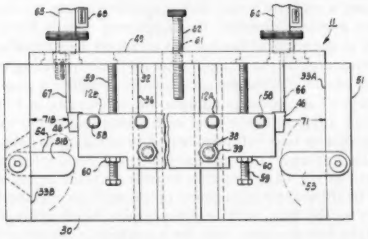
edge can be moved substantially radially toward and away from the inner peripheral surface of said rim and positioned adjacent the inner edge of said wheel rim to afford a visual indication of the position of the plane of said inner wheel rim edge.

4,290,206

TOOL PRESETTING FIXTURE

Milton L. Benjamin, Moreland Hills; Wilbur N. Miles, Chagrin Falls, and Edward A. Majkrzak, Newburgh Heights, all of Ohio, assignors to Erickson Tool Company, Solon, Ohio

Filed Oct. 9, 1979, Ser. No. 82,771
Int. Cl.³ B23B *49/00*; G01B *5/02*
U.S. Cl. 33—185 R **15 Claims**



1. A tool presetting fixture for cross-slide type tool holders usable on a multiple spindle automatic machine tool, the tool holders each having a tool holding pocket on an end thereof adapted to mount a tool having a tool tip, said fixture comprising in combination:

a base,

means to secure to said base any said tool holder for cross-slide type tools,

movable element means mounted on said base and having a first gage surface for movement parallel to said base adapted for gaging the spindle centerline height of a tool tip in the tool holding pocket on the tool holder,

a wall carried on said base and having a second gage surface perpendicular to said base,

said second gage surface adapted for gaging the distance of the tool tip from said second gage surface, and

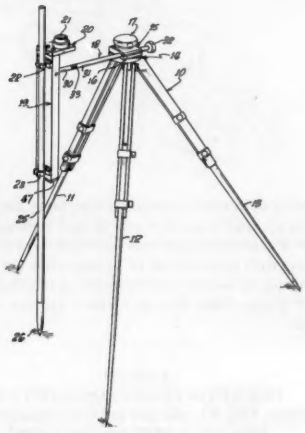
a wall carried on said base and having a third gage surface perpendicular to said base and perpendicular to said second gage surface adapted for gaging the distance from the tip of the tool to said third gage surface to gage for the workpiece cutting radius of the tool tip on a workpiece in the respective machine spindle.

4,290,207

SURVEYING INSTRUMENT

James S. Browning, 19004 Groverdale, Covina, Calif. 91722; Peter F. Pfeiler, 2241 Ardsheal Dr., La Habra Hts., Calif. 90631, and Vernon Lowery, 1731 E. Vermont, Anaheim, Calif. 92805

Filed Mar. 6, 1980, Ser. No. 127,826
Int. Cl.³ G01C *15/08*
U.S. Cl. 33—295 **12 Claims**



1. A device for holding a surveying instrument plumb and level, said device comprising:

means for attachment to tripod means;

clamp means affixed to said means for attachment, said clamp means having a lower plate having a groove formed therein, an upper plate having a groove formed therein, tightening means abutting said upper and lower plates for urging said upper and lower plates together and for holding them together in a tightened relationship, said clamp means permitting rotation of the upper and lower plates with respect to the tripod means when said clamp means are in a loosened condition;

a slide bar held between said grooves; and

a clip bar hingedly held by said slide bar, said clip bar having level indicating means affixed thereto and having clip means for holding a surveying instrument, whereby the orientation of a surveying instrument held by said clip bar can be adjusted in a north/south direction by the longitudinal movement of the slide bar in said clamp means and in an east/west direction by the rotation of the upper and lower plates with respect to the tripod means.

4,290,208

PROCESS FOR THE DEHUMIDIFICATION OF MOIST AIR OR SATURATED WATER VAPOR

Lars G. Hellman, Norrtullsgatan 10, 113 27 Stockholm, Sweden

Filed Mar. 25, 1980, Ser. No. 133,877
Claims priority, application Sweden, Apr. 4, 1979, 7902979
Int. Cl.³ F27D *3/00*
U.S. Cl. 34—9 **4 Claims**

1. A counter-current absorption process for the dehumidification of moist air or saturated water vapour, e.g. obtained in the drying of solid material comprising the steps of: introducing a concentrated absorption liquid into an absorption device at a temperature at least equal to the temperature which at

atmospheric pressure corresponds to the boiling point of the absorption liquid at the concentration corresponding to the water vapour pressure reduction required in order to attain the desired low relative humidity of the exit gas or the desired degree of superheating of the exit water vapour, the only component of the absorption liquid having a substantial vapour pressure is water; introducing moist air or saturated water vapour into said absorption device counter-current to said liquid where the absorption is carried out adiabatically, and with weight proportions between the absorption liquid and the gas or vapour such that most of the condensation heat of the water vapour condensed during the absorption is transferred to the gas or vapour becoming progressively drier, to thereby raise the temperature thereof; regenerating the diluted absorption liquid obtained after the absorption is concentrated and recycling the concentrated liquid for reuse while the demoisturized and heated gas or vapour is recycled for again taking up moisture or for being again converted to saturated water vapour.

4,290,209

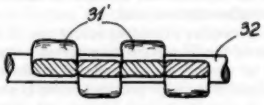
DRYER FABRIC

John G. Buchanan, and Donald G. MacBean, both of Ottawa, Canada, assignors to Jwi Ltd., Montreal, Canada

Continuation of Ser. No. 906,434, May 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 846,355, Oct. 28, 1977, abandoned. This application Apr. 15, 1980, Ser. No. 140,475

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—123 **15 Claims**



1. A dryer fabric for use in a papermaking machine comprising a plurality of interwoven warp and weft monofilament plastic polymeric strands woven with approximately 100% warp fill with edges of adjacent warp strands generally lying in common planes disposed generally normal to the plane of the fabric, at least said warp strands which extend in the machine direction, have a flattened cross-section with the long axis of said cross-section extending parallel to the plane of the fabric; the lowered profile of said flattened strands defining restricted diagonal apertures in the mesh of the fabric to thereby reduce the permeability of said fabric uniformly throughout.

4,290,210

DEVICE FOR DRYING WEB MATERIAL

Eric G. B. Johansson, Växjö, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

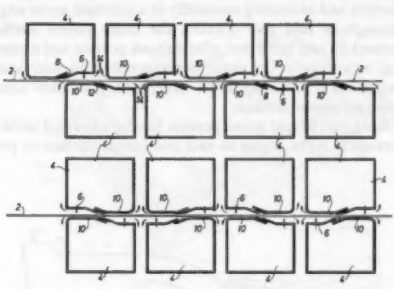
Filed Nov. 28, 1979, Ser. No. 97,917

Claims priority, application Sweden, Dec. 6, 1978, 7812565

Int. Cl.³ F26B *13/20*

U.S. Cl. 34—156 **13 Claims**

1. A device for drying a web (2) having guidance means for guiding the web in a plane, gas distribution boxes (4) arranged on both sides of the plane of guidance for the web, said boxes (4) including first opening means (6) arranged to direct the gas essentially perpendicularly towards said plane and second opening means (8) arranged to direct the gas essentially along said plane, characterized in that in each of the distribution boxes said first opening means (6) are disposed in a first line extending transverse to said path of guidance and said second opening means (8) are disposed in a second line essentially parallel thereto, said box having an adjoining surface portion (10) extending alongside said second line at a side remote from said first line, guide means (22) associated with said second opening means for directing the gas issuing therefrom away from the first line towards and along said adjoining surface portion (10) of the box, said surface portion being on a higher level than said first opening means (6), said first opening means



(6) of each box on one side of said guidance plane being located directly opposite said surface portions (10) on a higher level in a confronting box on the other side of said guidance plane.

4,290,211

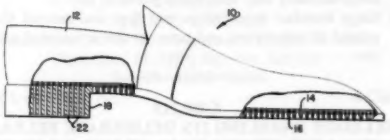
VENTILATING OUTSOLE

George Csengeri, 5624 Calle de Arboles, Torrance, Calif. 90505

Filed Oct. 15, 1979, Ser. No. 84,991

Int. Cl.³ A43B *7/06*

U.S. Cl. 36—3 B **1 Claim**



1. In an article of footwear having an outsole, an insole and some form of upper for maintaining the outsole on the foot, the improvement comprising;

a multiplicity of perforations uniformly distributed throughout a major portion of the ground engaging portion of the outsole through the material of the outsole, to open at the inner surface of the outsole, said perforations having a spacing relative to one another on the order of 5 to 7 millimeters center-to-center and each of said perforations at the inner surface of the outsole having a span on the order of about 1.60 to about 2.00 millimeters,

said insole being formed with a plurality of spaced perforations of the same span as said perforations in said outsole, said insole further having a spaced plurality of stubs protruding downwardly from the lower surface of said insole engaging some only of said perforations in said outsole for indexing said insole to said outsole.

4,290,212

WOODEN SHOE INCLUDING HINGE

Karl J. Matsson, Karlskrona, Sweden, assignor to Stiftelsen Blekinge Produkter, Karlskrona, Sweden

Filed Mar. 3, 1980, Ser. No. 126,713

Claims priority, application Sweden, Mar. 6, 1979, 7901989

Int. Cl.³ A43B *13/08, 1/06*

U.S. Cl. 36—33 **3 Claims**

1. A shoe having an articulated connection in a bottom portion to which is attached an upper foot-receiving portion, said bottom portion comprising

a heel portion;

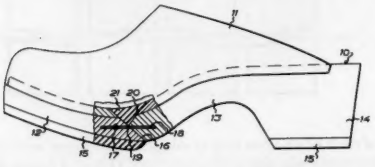
a sole portion;

a shank portion having a front part and a rear part, said rear

part connected to said heel portion and said front part connected to said sole portion;

said front part connection formed as two abutting planar surfaces, one of said planar surfaces formed on said sole portion and extending upwardly at a constant acute angle throughout said sole portion, the other planar surface formed on said front part of said shank portion and extending upwardly at an angle corresponding to said acute angle and terminating at an intermediate location along said one planar surface;

said front part of said shank portion having a beveled surface formed at right angles to said one planar surface to provide a groove extending upwardly from said terminating location;



a yieldable material fixedly mounted in said groove;

a first slot formed in said sole portion, said slot originating in said one planar surface immediately adjacent and below said terminating location and extending longitudinally into said sole portion;

a second slot aligned with said first slot, said second slot originating in said other planar surface and extending longitudinally into said shank portion; and

a hinge member mounted in said first and second slots to extend therebetween and provide the articulated connection.

4,290,213

SKI-BOOT ENABLING ITS DELIBERATE RELEASE FROM THE SKI BY MEANS OF THE SKI-STICK

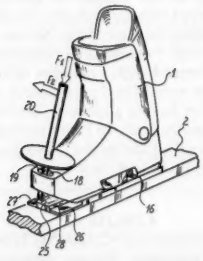
Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Dec. 19, 1978, Ser. No. 970,963

Claims priority, application France, Dec. 23, 1977, 77 39072

Int. Cl.³ A43B 5/04; A63C 9/00

U.S. Cl. 36—117 **17 Claims**



1. A ski-boot adapted to be releasably engaged on a ski, said ski-boot comprising one bearing surface adapted to cooperate with a lower portion of a ski-pole whereby deliberate movement of said ski-pole relative to said ski while said lower portion of said ski-pole bears against said bearing surface causes said ski-boot to be released from said ski, said ski boot further comprising retention means for retaining the lower portion of said ski-pole in cooperation with said bearing surface during said deliberate motion of said ski-pole, wherein said bearing surface and said retention means comprise a single hole.

4,290,214

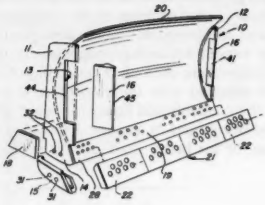
EARTHWORKING IMPLEMENT SIDE PLATE WEAR MEMBER

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 4, 1980, Ser. No. 150,869

Int. Cl.³ E02F 9/28

U.S. Cl. 37—141 T **18 Claims**



1. In an earthworking implement (**10**) having a sidewall member (**11,12**) defining a bottom edge portion (**14**), wear member structure comprising:

a U-section member (**15**) defining a bottom bight portion (**25**), and spaced legs (**23,24**) extending upwardly from said bottom bight portion to define a channel (**48**) receiving said sidewall member bottom edge portion (**14**), and front edge portions;

securing means (**33,35**) removably securing said U-section member to said sidewall member to define a replaceable wear member thereon; and

a transverse member extending across one of said front edge portions of the U-section member and the bottom edge portion of the sidewall member into abutment with the other of said front edge portions of the U-section member.

4,290,215

BADGE WITH PIN

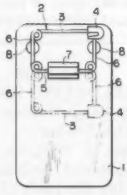
Yaeko Kise, 35-10 Asakusabashi 1-chome, Taito-ku, Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,705

Claims priority, application Japan, Oct. 12, 1979, 54-140969[U]

Int. Cl.³ A44C 3/00

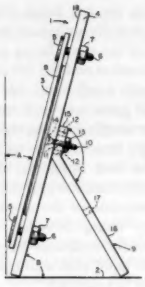
U.S. Cl. 40—1.5 **4 Claims**



1. A badge comprising a pin pivotally movable attached to the back surface of the badge, said pin being a resilient wire member bent substantially in a rectangle, with the opposite ends thereof positioned at one corner thereof, said wire member having a hook portion at one end thereof and a sharp point at the other end, which is adapted to engage said hook portion, said resilient wire member having the distance between a prong thereof with the sharp point and a prong opposite thereto larger than the thickness of a thumb or forefinger, said wire member is coiled at the other end of the prong with a sharp point, which is remote from said hook, two opposing sides of the rectangular wire member which interconnect the prong with a sharp point and the prong opposite thereto which forms a support stem constitute support prongs; and said badge

has on the back surface thereof a means for separably fixing said support prongs to the back surface of the badge.

4,290,216
COMBINATION HORIZONTALLY AND VERTICALLY MOUNTED DISPLAY
Jean L. Gale, 44 Deer Path La., Weston, Mass. 02193
Filed Jun. 30, 1980, Ser. No. 163,989
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152.1 **12 Claims**



1. A display member having a central horizontal axis and a 90° displaced vertical axis capable of being supported on a horizontal surface in a first mode and on a hook member attached to a vertical surface in a second mode comprising:

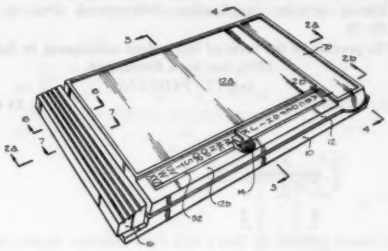
display means having a front viewing surface and a back surface;

support means capable of being readily displaced 90° with respect to said display means for supporting said display means on a horizontal surface when said support means is aligned with the central horizontal axis or the central vertical axis or on a hook member attached to a vertical surface when said support means is aligned with the central horizontal axis or the central vertical axis, said support means having first and second substantially flat, rigid, unbending portions, said first portion having a shorter length than said second portion, said first and second portions being joined at an angle, said first portion including a first fastening means and said second portion including a second fastening means; and

connecting means located on said back surface of said display means for readily releasably connecting and attaching said first fastening means to said display means, to provide a display member capable of being supported on a horizontal surface and for readily releasably connecting and attaching said second fastening means to said display means to provide a display capable of being supported on the hook member attached to a vertical surface.

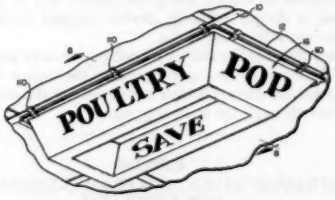
4,290,217
LIST FINDER
Henry Finkel, Westmount, Canada, assignor to Swedish Industrial Corporation of Canada Ltd., Montreal, Canada
Filed Oct. 2, 1979, Ser. No. 81,247
Int. Cl.³ B42F *17/20*
U.S. Cl. 40—389 **14 Claims**

1. A list finder comprising a base and a cover pivotably connected together by a hinge pin with the cover normally lying above said base and defining therewith a space for index sheets, said cover incorporating means for lifting selected index sheets when the cover is opened, wherein said base and cover both comprise integrally moulded parts having hinge pin seats including a normally downwardly facing seat on said moulded base part and a normally upwardly facing seat on said moulded cover part, said base part having a clear space below said downwardly facing seat and said cover part having a clear space above said upwardly facing seat whereby said base part is capable of being formed by moulding by a unitary mould member which both forms a bottom surface of said base part and also forms said downwardly facing seat, said cover part having a configuration which is mouldable by a unitary mould



member which both forms a top surface of said cover part and also forms said upwardly facing seat, said base and cover parts also including moulded surfaces for holding said seats in contact with the hinge pin during relative pivotal movement of the parts.

4,290,218
CEILING MODULE
Fred Drueck, Jr., 4941 W. Henderson, Chicago, Ill. 60641
Filed Jun. 19, 1980, Ser. No. 160,958
Int. Cl.³ G09F *13/00*
U.S. Cl. 40—553 **4 Claims**



1. An advertising display module for use with suspended ceilings having spaced-apart grid members defining panel receiving areas, ceiling panels removably supported by said grid members in said panel receiving areas and lighting fixtures disposed in cooperative working relationship with pre-determined ones of said ceiling panels, said advertising display module being co-extensive in area with the respective ones of said panel receiving areas and supported by said grid members defining the respective ones of said panel receiving areas, whereby one or more of said advertising display modules can be removably disposed in conjunction with or in substitution for any one of said ceiling panels to provide readily visible advertising, said advertising display module comprising a hollow enclosure formed by a plurality of walls, at least some of which depend downward with respect to said suspending ceiling and provide surfaces for receiving thereon indicia, and indicia on at least one of said surfaces, and securement means comprising a clip removably secured to said grid member and having a shoulder forming a support surface upon which said peripheral rim seats to support said module from said grid members.

4,290,219
TARGET SIGHT RECORDING APPARATUS

Hans Boller, Alte Landstrasse 79, Thalwil, and Max Oschwald, In der Fadmatt 26, Urdorf, both of Switzerland

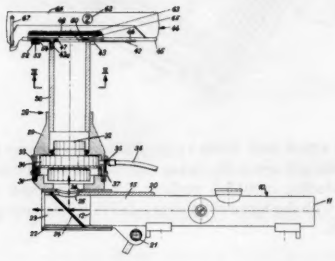
Filed Jun. 3, 1976, Ser. No. 692,452

Claims priority, application Switzerland, Jun. 4, 1975, 7170/75

The portion of the term of this patent subsequent to Jul. 22, 1996, has been disclaimed.

Int. Cl.[3] F41C 27/00

U.S. Cl. 42—1 R 13 Claims



1. In a firearm having a trigger and a telescopic sight through which light from a target zone can pass along the optical axis of the sight through an eyepiece to reach the eye of an observer, target sight recording apparatus comprising

an optical beam splitter element rigid with the telescopic sight for diverting a fraction of the light passing through the telescopic sight along a path extending at an angle to the optical axis,

a photographic camera rigid with the telescopic sight and inclined at an angle to receive the deflected light,

the camera having an objective lens system, a camera shutter, and a cassette for housing photographic exposure material all aligned along the optical axis of the camera and a shutter releasing device coupled to actuate the camera shutter, and

means coupling the shutter release device with the trigger of the firearm so that upon operating the trigger the camera shoots the picture which at that instant the observer can view through the telescopic sight.

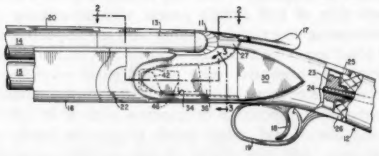
4,290,220
LIGHTWEIGHT STOCK AND FRAME CONSTRUCTION FOR A FIREARM

William B. Ruger, Croydon, N.H., assignor to Sturm, Ruger & Co., Inc., Southport, Conn.

Filed Jul. 9, 1979, Ser. No. 55,643

Int. Cl.[3] F42C 23/00

U.S. Cl. 42—75 D 5 Claims



1. A lightweight stock and frame construction for a firearm having a frame the forward end of which is formed with a longitudinally extending open-top recess defined by right hand and left hand side walls, a bottom wall and rear end wall of the frame; a stock the forward end of which is secured to the rearward end of the frame; and at least one barrel pivotally mounted on the forward end of the frame for rotation from its closed "firing" position to its open "loading and unloading" position and return, the barrel being snugly received in the longitudinally extending open-top recess formed in the forward end of the frame when at its closed position;

the right hand side wall of the frame being formed with a longitudinallly extending right hand cut-out opening and the left hand side wall of the frame being formed with a longitudinally extending left hand cut-out opening, each of said openings extending forwardly from the rear end wall of the frame to a point a short distance rearward of the forward end of the frame, the periphery of the opening formed in the right hand side wall and the periphery of the opening formed in the left hand side wall of the frame each having an inwardly undercut bevelled surface;

the right hand side of the stock being provided with a right hand side wall extension and the left hand side of the stock being provided with a left hand side wall extension, said right hand and left hand side wall extensions of the stock each extending forwardly into the right hand and left hand side wall openings, respectively, of the frame and being snugly received in said openings, the periphery of the right hand side wall extension and the periphery of the left hand side wall extension of the stock each being formed with an inwardly rising bevelled surface that firmly contacts the inwardly undercut bevelled surface of the right hand and left hand side wall opening in which each side wall extension is received;

the right hand side wall and the left hand side wall of the frame each being provided with an inner support member disposed on the inner surface of each side wall at the forward end of the longitudinally extending cut-out opening formed therein, the inner support member at the forward end of the right hand side wall opening of the frame contacting the forward end of the inner surface of the right hand side wall extension of the stock received in said opening, and the inner support member at the forward end of the left hand side wall opening of the frame contacting the forward end of the inner surface of the left hand side wall extension of the stock received in said opening.

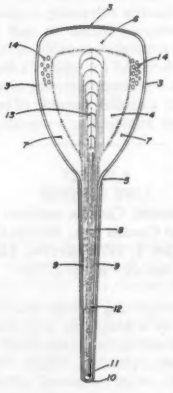
4,290,221
MINNOW DIPPERS

Harold C. Dotson, Sr., P.O. Box 1306, Socorro, N. Mex. 87801

Filed Nov. 13, 1979, Ser. No. 93,540

Int. Cl.[3] A01K 97/00

U.S. Cl. 43—4 6 Claims



1. A minnow dipper of transparent material so as to avoid unduly arousing a minnow as it is being scooped-up into the minnow dipper while in a pool of water, e.g. in a minnow bucket, said dipper

a dipper portion which is integrally formed with an elon-

gated handle portion extending longitudinally rearwardly therefrom to a free end;

said dipper portion including a bottom wall, two opposite upstanding sidewalls and an upstanding front wall;

said handle portion being constituted by wall means of hollow, steeply generally conical shape, so as to be convergent away from said dipper portion, and having means defining a longitudinally extending, upwardly opening slot through said wall means, extending from said dipper portion to adjacent said free end, thereby providing an upwardly open sluiceway from said dipper portion to adjacent said free end of said handle portion;

said dipper portion being generally triangular as seen in top plan, with said two opposite sidewalls converging from laterally opposite margins of said front wall to said handle portion;

said bottom wall of said dipper portion being generally upwardly concave and including an upwardly opening, longitudinally elongated shallow trough which begins, gradually, midway between said sidewalls near said front wall and increases in depth until smoothly merging with said sluiceway there said dipper portion adjoins said handle portion;

at least one of said upstanding walls of said dipper portion having opening means provided therethrough which extend down to adjacent said bottom wall, but insufficiently downwards to substantially drain said dipper portion when said dipper portion is being held to contain a minnow, but sufficiently to cause the minnow to lower into said shallow trough; said bottom wall and shallow trough thereof being imperforate;

means providing an upstanding stop for said slot, at the free end of said handle portion; and

drain opening means through said handle portion near said stop, so that when the minnow dipper is used to scoop-up a minnow from a pool of water, so long as the dipper is maintained with said trough lowermost where said dipper portion adjoins said handle portion, excess water will drain out of said opening means and lower the minnow, still in water, into said shallow groove, and so that as the minnow dipper is then tilted slightly to place the free end of the handle portion at least nearly as low as said trough where said dipper portion adjoins said handle portion, the minnow will reorient itself downstream and sluice with water contained in said dipper portion below said opening means down and sluiceway towards said upstanding stop, whereupon the water in the sluiceway will drain out of said drain opening means leaving the minnow aground in said sluiceway, oriented with its head away from said dipper portion;

said handle portion being of sufficient depth that when minnows of sizes commonly used as bait become aground in said sluiceway and exposed through said slot, but closely flanked on both sides by said wall means throughout a substantial part of the height of the minnow.

4,290,222

FISHING APPARATUS

William D. McLeod, Westland, Mich., assignor to Fishing Innovations, Inc., Westland, Mich.

Filed May 19, 1980, Ser. No. 150,721
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—15 **5 Claims**

1. Apparatus for jerking a fishline, comprising:

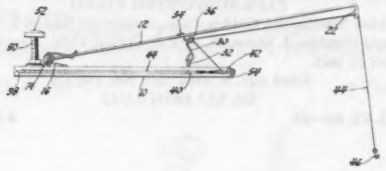
a base;

an elongated arm having a first end, a section transverse to the longitudinal axis of the arm, and a line receiving eye at the opposite end of the arm;

means pivotally connecting the arm to the base for pivotal motion between a first position in which the transverse section is adjacent the base, and a second position;

a trigger member pivotally connected to the base, said trigger member having a hook engageable with the transverse section of the arm to prevent motion of the arm toward said second position, the hook being movable by a motion of the hook towards the eye of the arm for releasing the arm, the trigger member having an elbow for receiving a fishline;

a fishline having one end connected to the base and being disposed in the eye of the arm and through the elbow of



the trigger member such that a pull on the line moves the trigger to release the arm for motion toward said second position; and

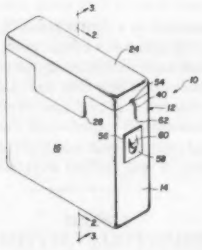
a bias member urging the arm from said first position toward said second position whereby the line is jerked as the arm is moved from said first position toward said second position.

4,290,223

FISHERMAN'S LEADER/LINE DISPENSER AND DECOILER

John R. Ostenberg, and Kenneth M. Ligas, both of Boulder, Colo., assignors to Creative Anglers

Filed Jul. 27, 1979, Ser. No. 61,330
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—54.5 R **6 Claims**



1. A fisherman's leader/line dispenser and decoiler comprising:

container means having side walls, a bottom and a top;

a spool of fisherman's leader/line mounted within said container means;

first longitudinally extending, generally rectangular, resilient pad means mounted within said contained means;

second longitudinally extending, generally rectangular, resilient pad means mounted within said container means in an opposing posture with respect to said first resilient pad means, said first and second resilient pad means being mounted so as to be self-biasing in mutual opposing engagement;

said top comprises a cap and one of said first and second resilient pad means is mounted upon an inside surface of said cap and the other of said first and second resilient pad means is mounted above said spool of fisherman's leader/line, said first and second resilient pad means extend substantially across an upper zone of said container; and

aperture means extending through said container means wherein a fisherman's leader/line may be threaded from said spool between said mutually opposed longitudinally extending resilient pads and through said aperture means away from said container means wherein drawing a length

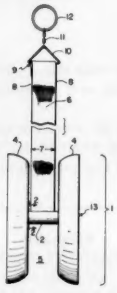
of leader/line between said first and second longitudinally extending resilient pad means along the long dimensions thereof and out said container serves to erase coil memory of the leader/line as the leader/line is dispensed.

4,290,224

TAPE-SUPPORTED YO-YO

Patrick MacCarthy, Golden, Colo., assignor to Ramon E. Bisque and Franklin J. Stermole, both of Golden, Colo., a part interest to each

Filed Apr. 9, 1980, Ser. No. 138,729
Int. Cl.³ A63H *27/12*
U.S. Cl. 46—61 **4 Claims**



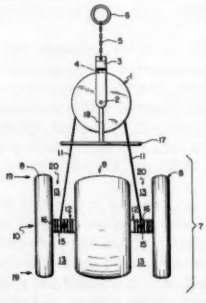
1. A toy capable of combined rotational motion about a horizontal axis and translational motion in a vertical direction, comprising:
an axle;
a first disc connected at a center point to said axle;
a second disc connected at a center point to said axle; and
a torsion resistant tape connected at one end to said axle at a position between said first disc and said second disc said tape being connected to said axle in such a manner that said tape winds around and unwinds from said axle during said rotational motion about said horizontal axis and translational motion in said vertical direction.

4,290,225

LOOPED-STRING PULLEY-SUPPORTED YO-YO

Patrick MacCarthy, 37 Mines Park, Golden, Colo. 80401

Filed Feb. 11, 1980, Ser. No. 120,289
Int. Cl.³ A63H *27/12*
U.S. Cl. 46—61 **5 Claims**



1. A toy capable of combined rotational motion about a horizontal axis and translational motion in a vertical direction, comprising:
an axle;
a first disc connected at a center point of said disc to said axle;
a second disc connected at a center point of said disc to said axle;
a third disc connected at a center point of said disc to said axle at a position on said axle between said first and second discs;
a string connected at one end to said axle at a point near said first disc, and connected at its other end to said axle at a point near said second disc; and
a rotatably mounted support means over which said string is looped in a manner such that said string may slidably move over said rotatably mounted support means.

4,290,226

FLEXIBLE FLYING DISC TOY

Allen R. Stauffer, 860 Normandy Dr., Suffolk, Va. 23434

Filed Nov. 15, 1979, Ser. No. 94,495
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—74 D **6 Claims**

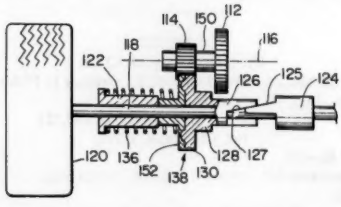
1. A flying disc or saucer toy having aerodynamic properties so that, when tossed and simultaneously rotated, said toy will fly in a stable manner, said toy comprising: a flat, circular body portion of flexible sheet material; a flexible ring attached to the periphery of said circular body portion, said ring being made of plastics material having sufficient elastic memory to be shape retaining and stretch said body portion into a disc shaped configuration yet pliable so that said toy may be folded and/or crumpled for storage; and an integral upstanding, circumferential rim on said ring, said body portion being attached to said rim whereby said disc toy assumes an unfolded shape with a flat, upper surface and a recessed undersurface to thus exhibit stable, aerodynamic properties when tossed or thrown.

4,290,227

TORQUE TRANSMISSION SYSTEM FOR MOTOR DRIVEN TOY

Juky Shimamura, Chigasaki, Japan, assignor to Asahi Communications Inc., Soka, Japan

Filed Aug. 28, 1980, Ser. No. 182,190
Claims priority, application Japan, Mar. 4, 1980, 55-26156
Int. Cl.³ A63H *17/00*
U.S. Cl. 46—206 **7 Claims**



1. In a motor driven toy, a transmission system comprising:
motor means;
a rotary output shaft;
driven means fixed on said rotary output shaft;
a first rotary driving member drivingly connected to said motor means having a first diameter and being disposed to be rotated at a predetermined position thereof;

a second rotary driving member having a second diameter smaller than said first diameter;

connecting means for connecting said first and second rotary driving members at the same rotational rate;

a first output member axially slidable on said output shaft and drivingly engageable exclusively with said first driving member;

a second output member axially slidable on said output shaft together with said first output member and being rotated with said first output member and drivingly engageable exclusively with said second driving member;

a first cam member axially slidable on said output shaft and rotated with said first output member including at least one further slanted cam surface;

a second cam member fixed on said output shaft, including at least one first slanted cam surface in contact with said first cam surface of said first cam member;

a synchronizing rotary member axially slidable on said output shaft for synchronizing said second output member with said second rotary driving member during changeover from high-speed low-torque operation to the low-speed high-torque operation, said synchronizing rotary member being biased toward said first and second output members; and

two-way clutch means operatively disposed between said synchronizing rotary member and said second output member.

4,290,228

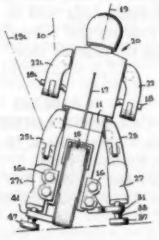
TOY VEHICLES WITH AUTOMATIC BANKING

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.

Filed Feb. 13, 1980, Ser. No. 121,023

Int. Cl.³ A63H *17/36*; B62D *9/02*

U.S. Cl. 46—262 **62 Claims**



1. A toy vehicle for operation on a supporting surface, the vehicle comprising:

a frame;

a wheel mounted to the frame;

a steering mechanism, supported on the frame, for causing the vehicle to negotiate turns;

an additional wheel mounted to the steering mechanism so that the wheels are generally one in front of the other;

a pair of side supports mounted to the frame, one on each side, each support being moveable from a first position adjacent to the frame to a second position spaced outwardly from the frame, said supports for engaging such supporting surface to prevent the vehicle from falling over sideways;

means on the frame for moving said supports inwardly and outwardly in coordination with the steering mechanism such that during a turn the support on the inside of the turn is moved toward its second position spaced outwardly from the frame and the support on the outside of the turn is maintained in its first position adjacent to the frame; and

banking means responsive to the steering mechanism and operatively associated with each support for tilting the vehicle during the turn toward the inside of the turn.

4,290,229

INSTALLATION FOR CULTIVATION OF CROPS ON WATER

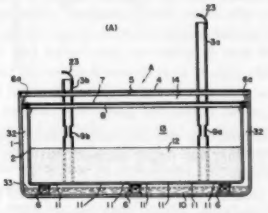
Masahiro Miura, 11-2, Miyanishi-cho, 5 chome, Fuchyu-City, Tokyo, Japan

Filed Feb. 14, 1980, Ser. No. 121,557

Claims priority, application Japan, Oct. 4, 1979, 54-128723

Int. Cl.³ A01G *9/02*

U.S. Cl. 47—66 **9 Claims**



1. An installation for the cultivation of crops on water comprising:

a box-like floatable outer housing;

an inner cultivation housing supported within said outer housing and forming a double-walled bottom and double-wall sidewalls therewith, the bottom of said cultivation housing having a plurality of holes extending therethrough;

a transparent plate glass roof on said outer housing in air-tight relationship therewith;

a drip plate formed of plate glass having a plurality of holes extending therethrough positioned over said cultivation housing, said bottom and the region between said double-walled sidewalls being in communication with the interior of said cultivation housing through the holes in said drip plate;

a plurality of ventilation tubes mounted in said cultivation housing and extending through said drip plate and roof for communication with the air above said roof, a first set of said ventilation tubes extending beyond said roof to a higher elevation than a second set of said ventilation tubes, a lower portion of each of said ventilation tubes being in communication with the interior of said cultivation housing;

the interior of said cultivation housing being adapted to contain a quantity of soil and said bottom being adapted to contain a quantity of water, whereby water from said bottom is periodically and automatically evaporated and condensed for passage through the holes in said drip plate to prevent undue drying of the soil and to supply sufficient water to the soil to enable cultivation thereof.

4,290,230

GATE FOR SUPERMARKETS AND SIMILAR ESTABLISHMENTS

Amaury H. t'Kint de Roodenbeke, Brussels, Belgium, assignor to Technical Services, Societe Anonyme, Brussels, Belgium

Filed Jan. 15, 1980, Ser. No. 112,271

Claims priority, application European Pat. Off., Jan. 22, 1979, 79200038.2

Int. Cl.³ E01F *13/00*

U.S. Cl. 49—49 **2 Claims**

1. A gate of the type generally used in supermarkets and similar establishments comprising:

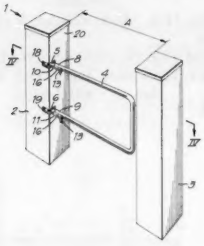
a generally vertical rotatable axle;

vertically spaced supporting levers secured to and extending

laterally of said axle, said levers having generally flat upper surfaces;

a pair of cylindrical rods secured to each upper surface in spaced parallel relation;

a U-shaped barrier having free ends and headed bolts pivotally connecting said free ends to said supporting levers to overlie said flat upper surfaces between said cylindrical rods; and



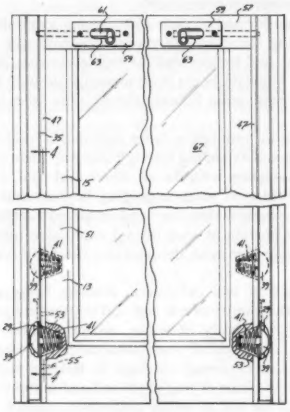
spring means reacting against the heads of said bolts urging said free ends against said upper surfaces whereby said barrier may be rotated in either direction.

4,290,231

WINDOW ASSEMBLY

Joseph N. Blair, Detroit, Mich., assignor to Mamie I. Blair Adams, Detroit, Mich.

Filed Aug. 3, 1979, Ser. No. 63,603
Int. Cl.[3] E05D *15/22*
U.S. Cl. 49—173 **1 Claim**



1. A window assembly for a building wall comprising a hollow frame including opposed sides, a sill and a header;

a trackway mounted upon and secured to each frame side including opposed inner and outer channel tracks of dovetail shape in cross section;

elongated opposed pairs of channel slides of dovetail shape in cross section movably mounted in opposed tracks respectively;

a window support bracket overlying each slide and adjacent its lower end pivotally mounted thereon;

a lower sash interposed between a pair of opposed support brackets and secured thereto;

an upper sash interposed between an additional pair of opposed support brackets and secured thereto;

the lower and upper sashes and connected channel slides adapted for vertical adjustments along the inner and outer tracks respectively;

the lower and upper sashes and connected support brackets adapted for selective inward pivotal movement approximately 90° to facilitate cleaning;

retractable latching means on said sashes engageable with the channel slides for securing the sashes within said tracks;

the outer surface of each channel slide having an elongated V-shaped groove;

the outer surface of each window support bracket having a corresponding V-shaped base normally nested and retained within the channel slide grooves respectively when said sashes are in an upright position, and are angularly displaced from said grooves when the sashes are pivoted inwardly;

the pivotal mounting of each window support bracket including a bolt within a channel slide projecting inwardly thereof and through a window bracket;

and a coiled compression spring anchored upon said bolt and bearing against the window bracket, normally biasing the bracket base into the slide groove;

the slide camming said bracket inwardly on rotation thereof, against the action of said spring for biasing the window sash and bracket in any selected angular position of adjustment, said window brackets on return rotation adapted to snap into said slide grooves respectively;

the securing of a sash between a pair of support brackets including opposed spaced inwardly directed channels on said brackets, the sides of each window sash being nested and retained within said channels respectively;

and fasteners securing said brackets to said window sashes respectively;

said latching means including a manually retractable bolt nested within an upper portion of each window sash and longitudinally projected into a corresponding recess in an adjacent channel slide;

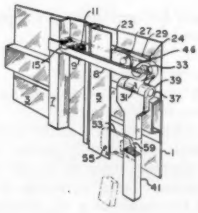
and a latch plate on said sash having a bayonet slot for guidably retaining said bolt in a locking position, and permitting rotation and retraction thereof to disconnect the bolt from the channel slide.

4,290,232

FREIGHT CAR DOOR LOCKING MECHANISM

Jackson A. Shook, LaGrangePark, Ill., assignor to Evans Products Company, Portland, Oreg.

Filed Dec. 3, 1979, Ser. No. 99,832
Int. Cl.[3] E05F *11/00*; E05D *13/04*
U.S. Cl. 49—277 **16 Claims**



1. In combination with a pair of members, at least one of which is a sliding door, said members having opposed vertical edges and being relatively movable from a closed position wherein their vertical edges abuttingly engage each other and open position wherein their vertical edges are spaced from each other, a locking device comprising a hasp, means pivotally mounting said hasp on one of said members, resilient means biasing said pivotal mounting means away from the edge of said one member, an arm pivoted on a transverse axis to said other member and extending away from the edge of said

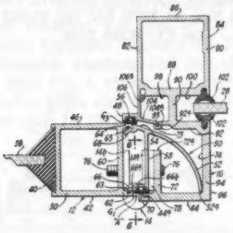
other member, the free end of said hasp being removably pivoted to the free end of said arm, and means for holding said arm in slight disalignment with said hasp when said door is fully closed, said resilient means then maintaining said hasp in tension and the abutting edges of said members in tightly engaged relation, said arm being swingable about its pivotal mounting on said other structure to an over-center position with respect to said hasp, whereby said hasp is placed under compression to move the edges of said members away from each other and permit detachment of said hasp from its pivotal connection to said arm to accommodate further separation of said members.

4,290,233

SAFETY DOOR ENTRANCE

S. Eugene Hubbard, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Aug. 28, 1979, Ser. No. 70,432
Int. Cl.³ E06B 7/16
U.S. Cl. 49—383 **24 Claims**



1. In combination, a door having opposite faces and a hinge stile element along one edge thereof, a door jamb element adjacent said hinge stile element, and hinge means interconnecting said elements for supporting said door for pivotal movement about a hinge axis parallel of said elements to swing between a closed and an open position wherein a corner edge of said door on one face thereof moves between corresponding positions closely adjacent said jamb element and spaced apart from said jamb forming a gap between said corner and jamb element,

a finger protector secured on one of said elements to extend between facing portions thereof including a curved wall surface for continuously bridging said gap while said door swings between said open and closed positions,

the other of said elements including a pocket for receiving said finger protector when said door is closed, and

a pair of spaced apart weatherstrip means between said elements, one of said weatherstrip means mounted to provide a seal between said curved wall surface of said finger protector and said other element and the other of said weatherstrip means mounted to provide a seal between said elements adjacent a door face opposite from the door face adjacent said curved wall surface of said finger protector.

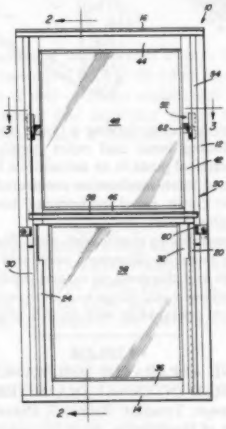
4,290,234

DEMOUNTABLE WINDOW CONSTRUCTION

Carmine De Maria, 39 E. Madison Ave., Collingswood, N.J. 08108

Filed Sep. 18, 1979, Ser. No. 76,618
Int. Cl.³ E05D 15/16
U.S. Cl. 49—415 **3 Claims**

1. A window construction including a frame having opposite side parallel vertical side frame members interconnected at their upper and lower ends by top and bottom transverse horizontal members extending and secured between the upper and lower ends of said side frame members, said frame defining an opening therethrough, bound by said members, and including front and rear portions, said rear portion of said frame including inwardly projecting and forwardly facing opposite side vertical retaining members supported from and extending at least substantially fully along said side frame members, a lower rear sash assembly disposed in said frame immediately forwardly of and guidingly engaged with the forwardly facing surfaces of said retaining members for guided vertical shifting of said lower sash assembly in said frame, at least the upper portions of said side frame members including vertically extending inwardly opening grooves formed therein and spaced forwardly of said forwardly facing surfaces, the upper opposite side portions of said lower sash assembly including oppositely outwardly projecting members slidably and rotatably received in said grooves, the lower portions of said side frame members including first inwardly projecting and vertically extending retaining flanges whose upper ends are spaced below the upper limit of travel of said lower sash assembly in said frame and behind which said lower sash assembly is snugly slidably received when said lower sash assembly is lowered in said frame, said side frame members defining forwardly facing vertical guide surfaces spaced slightly outwardly of the remote side surfaces of said lower sash assembly in a plane spaced slightly forward of the forward face of said lower sash assembly and extending substantially fully along said side frame members, a front upper sash assembly disposed in said frame immediately



forwardly of and guidingly engaged with said guide surfaces for guided vertical shifting of said upper sash assembly in said frame forward of said rear sash assembly and in passing relation therewith, said opposite side frame members including second lower inwardly projecting and vertically extending retaining flanges whose upper ends are spaced above the upper ends of said first flanges and below the upper limit of travel of said lower sash assembly in said frame and behind which said upper sash assembly is snugly slidably received when said upper sash assembly is lowered in said frame, a retainer assembly including vertical opposite side bars defining third inwardly projecting vertical flanges, the upper ends of said bars being pivotally supported from the upper ends of said side frame members with said bars closely overlying the forwardly facing opposite side portions of said upper sash for guidingly mounting the latter within said frame against removal therefrom, said retainer assembly being swingably supported from said frame for outward and upward swinging of the lower ends of said bars toward open positions, latch means carried by said frame for releasably latching said retainer assembly in a closed position with the lower ends of said third flanges being coextensive with the upper ends of said second flanges when said retainer is in said closed position, and yieldable friction means mounted on said upper sash assembly for engagement with said

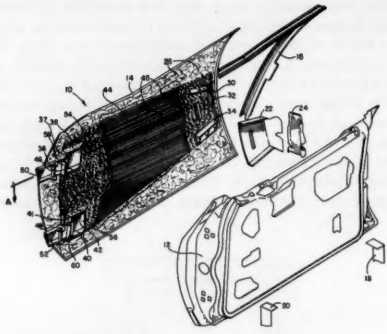
bars, when said retainer assembly is in the closed position, to bias said upper sash assembly rearwardly against said guide surfaces and to frictionally hold the sash assemblies in vertically adjusted positions thereof.

4,290,235

INTRUSION RESISTING STRAP FOR AUTOMOBILE DOORS

Herbert A. Jahnle, Havertown, Pa., and Richard B. Freeman, Wilmington, Del., assignors to The Budd Company, Troy, Mich.

Filed Oct. 24, 1979, Ser. No. 87,869
Int. Cl.³ B60J 5/04
U.S. Cl. 49—502 **8 Claims**



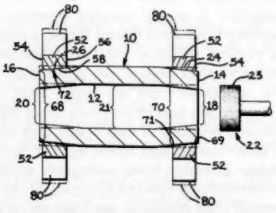
1. An automobile door having a hinge and a latch mechanism and including inner and outer panels for attachment between two vertical posts in an automobile body comprising:
(a) a hinge and latch mechanism connected to said door;
(b) a plastic outer panel comprising resin material and chopped glass fibers; and
(c) a band comprising continuous glass fibers integral with said outer panel in alignment with said hinge and latch mechanism and disposed to extend unidirectionally horizontally between said hinge and latch mechanism and said two vertical posts when said door is attached.

4,290,236

METHOD AND APPARATUS FOR MANUFACTURING A CONTOURED INTERNAL DIAMETER BUSHING

Thomas D. Brewer, Tremont; Robert J. Purcell, and James R. Sturges, both of Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00322, § 371 Date May 14, 1979, § 102(e) Date May 14, 1979, PCT Pub. No. WO80/02525, PCT Pub. Date Nov. 27, 1980.
This PCT application filed May 14, 1979, Ser. No. 89,117
Int. Cl.³ B24B 1/00, 5/40
U.S. Cl. 51—5 A **7 Claims**



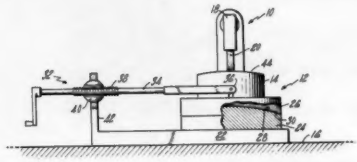
1. A method of forming tapers internally on ends (14,16) of tubes (10) having cylindrical bores (12), comprising:
compressing a first end (14) of a tube (10) having a cylindrical bore (12) radially inwardly sufficient to force said first end (14) to deform to a reduced internal diameter (18) which is of lesser size than the first end (14) internal diameter (21) in the absence of said compressing;
boring said tube (10) axially inwardly from said first end (14) with a boring tool (22) while said tube is compressed which bores a hole of a diameter (21) greater than said reduced internal diameter (18); and
releasing said first end (14) compressing to allow an external dimension (24) of said first end (14) to return towards its uncompressed size with concomitant generally uniform outward flaring of an interior portion (28) of said bore (12) at said first end (14).

4,290,237

FIXTURE FOR USE IN FORMING CYLINDRICAL SURFACES OF ACCURATE DIMENSION

Saulius M. Jameikis, Riviera Beach; Robert K. Stalcup, North Palm Beach Gardens; Joe F. Arnold, North Palm Beach, and Robert K. Hon, West Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 30, 1979, Ser. No. 99,062
Int. Cl.³ B24B 5/04
U.S. Cl. 51—34 A **4 Claims**



4. Apparatus for forming a cylindrical surface on a workpiece, comprising:
a grinding machine having a base plate and a traversing head including a grinding wheel mounted thereon;
a fixture for manipulating the workpiece through a circular arc which is perpendicular to the direction of travel of the traversing head, including
a movable template having a spherical surface and to which the workpiece is securable,
a fixed template having a spherical surface of inverse geometry to the spherical surface of the movable template in opposing relationship thereto, and over which the spherical surface of the movable template is slidable,
means restricting relative movement between said fixed and movable templates to a circular arc which is perpendicular to the direction of travel of the traversing head; and
means for traversing the grinding wheel in said head across the workpiece and means for incrementally moving said workpiece on the movable template across the path of the traversing head to form a cylindrical surface on the workpiece
wherein one of said spherical surfaces has a lattice of intersecting channels formed therein.

4,290,238

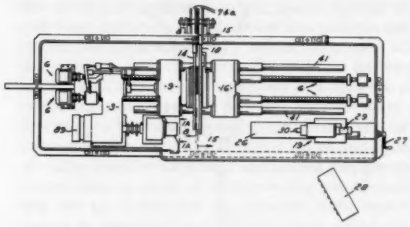
UNIVERSAL CRANKSHAFT FINISHING MACHINE

Edward E. Judge, Jr., Lansing, Mich., assignor to Industrial Metal Products Corporation, Lansing, Mich.

Filed Dec. 18, 1979, Ser. No. 104,784
Int. Cl.³ B24B 5/42
U.S. Cl. 51—58 **17 Claims**

1. A crankshaft bearing finishing machine comprising crankshaft rotating means, finishing arm means engageable with individual eccentric crankshaft pin bearings during rotation, means for retracting and moving said finishing arm means to a plurality of successive longitudinally spaced bearing positions,

means for effecting finishing engagement with respective bearings at said spaced bearing positions, and eccentric drive means



for said arm means separate from and synchronized with said crankshaft.

4,290,239

TOOL POSITIONER

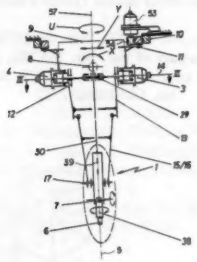
Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Industriewerke Karlsruhe Augsburg AG Zweigniederlassung Keller & Knappich, Augsburg, Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,628

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905784; Dec. 21, 1979, 2951832

Int. Cl.³ B24B *41/00*

U.S. Cl. 51—126 **13 Claims**



1. A positioner comprising:

a main support defining a pair of main pivot axes and carrying a guide;

respective main cranks having inner ends pivoted at said main pivot axes on said support and outer ends;

respective links having respective one ends pivoted on said outer ends of said cranks and having other ends;

a holder pivoted on said other ends of said links and having an elongated stem longitudinally displaceable in said guide; and

respective means for pivoting said main cranks on said main support about the respective main pivot axes.

4,290,240

AUTOMATIC EQUALIZER FOR ABRASIVE BELT

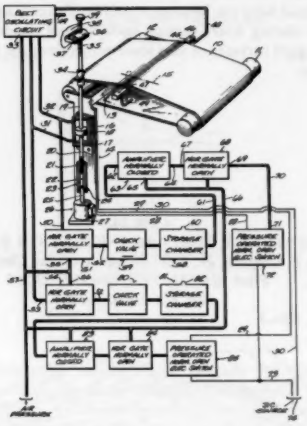
Charles E. Robinson, 208 Gardner Ave., Burlington, Wis. 53105

Filed Jan. 28, 1980, Ser. No. 116,068

Int. Cl.³ B24B *21/00*

U.S. Cl. 51—135 BT **10 Claims**

1. In an abrading machine including an endless belt supported for translating longitudinally on spaced apart rolls, oscillator means coupled to at least one of said rolls for oscillating said roll through opposite angles to cause said belt to move back and forth laterally on said rolls, means responsive to said belt reaching a predetermined limit of lateral movement in one direction by providing alternate signals for controlling said oscillator to move said belt in an opposite direction to another predetermined lateral limit, the travel times of said belt in opposite directions being subject to variations due to indeterminate characteristics of the belt, and the improvement comprising:



means for determining the time that it takes for said belt to move from one lateral limit to the other latera limit under the influence of said oscillator means, and

means for adjusting said oscillator means to change the angles through which it oscillates said roll to thereby equalize said times.

4,290,241

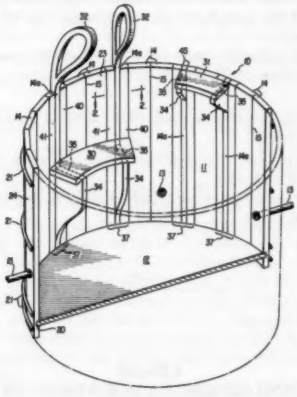
STAVE ASSEMBLIES, STAVES, AND TUBS CONSTRUCTED THEREWITH

Robert S. Tucker, P.O. Box 25362, Richmond, Va. 23260

Filed Feb. 16, 1979, Ser. No. 12,762

Int. Cl.³ E04G *11/06*; A47B *5/00*

U.S. Cl. 52—36 **12 Claims**



1. A hot tub comprising:

(a) a plurality of staves forming a wall for said tub,

(b) a bottom,

(c) a pair of support staves, each support stave having longitudinally extending side faces and an inwardly, laterally extending projection,

(d) each projection having a support surface positioned

intermediate the bottom of said tub and the top of said stave for supporting a seat,

(e) each of said support staves formed of a single fabricated board,

(f) said pair of support staves spacedly positioned in the wall of said tube for forming a portion thereof, and

(g) a seating board having ends thereof supported by the support surfaces of said stave projections for forming said seat.

4,290,242

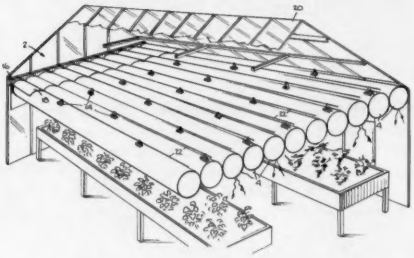
GREENHOUSE TUBULAR INSULATION BARRIER

William T. Gregory, Jr., 2177 Eighth Ave., Sea Girt, N.J. 08750

Filed Mar. 23, 1979, Ser. No. 23,296

Int. Cl.[3] E04B *1/34*

U.S. Cl. 52—2 **7 Claims**



1. An apparatus for retaining heat within a greenhouse and providing necessary light to the plants in the greenhouse comprising:

a glass roof;

a plurality of inflatable essentially transparent tubes below the glass roof arranged in parallel across the width of the greenhouse which tubes extend longitudinally from one end of the greenhouse to the opposite end of the greenhouse;

a header extending the entire width of the greenhouse at eave level which header is in communication with the tubes;

tube ties to constrict the ends of the tubes at the end opposite the header;

a sheet of clear plastic draped over the tubes at the constricted end; and

a blower motor adapted to deliver or evacuate air from the header.

4,290,243

BUILDING MEMBRANE HOLD-DOWN SYSTEM

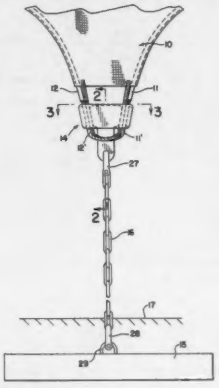
Gerald D. Mellin, Bradenton, Fla., assignor to Seaman Corporation, Sarasota, Fla.

Filed Mar. 27, 1980, Ser. No. 134,486

Int. Cl.[3] E04B *1/347, 1/00*

U.S. Cl. 52—63 **6 Claims**

1. A hold-down system for a tensioned membrane covering a rigid framework and having catenary cables secured to its lower edges between bays, comprising retainer means wedgably holding the end portions of two contiguous cables in overlapping loops, and flexible linear means detachably con-



nected at one end to said retainer means and adapted at its other end for detachable connection to a foundation anchor.

4,290,244

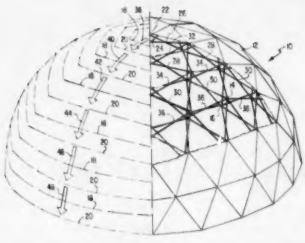
COLLAPSIBLE SELF-SUPPORTING STRUCTURES AND PANELS AND HUB THEREFOR

Theodore R. Zeigler, 9923 Indian Queen Point Rd., Oxon Hill, Md. 20022

Continuation of Ser. No. 919,131, Jun. 26, 1978, abandoned, and a continuation-in-part of Ser. No. 763,701, Jan. 28, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,246

Int. Cl.[3] E04B *1/32*

U.S. Cl. 52—80 **5 Claims**



1. An assembly of pivotally connected rod elements capable of being manipulated from a bundled, collapsed condition to an expanded, self-locking erected condition forming a self-supporting structure, said assembly comprising, in combination:

a plurality of pairs of crossed rod elements pivotally joined in scissored fashion substantially midway between their ends, one rod element of each pair being pivotally joined at its opposite ends to two other rod elements of adjacent pairs of rod elements and the other rod element of said each pair being pivotally joined at its opposite ends to the remaining two rod elements of said adjacent pairs of rod elements, whereby the pivotally connected ends of said pairs of rod elements lie at the corners of first and second similar polygons situated in spaced, parallel planes such that as the pairs of rod elements are scissored, the assembly is moved between a collapsed condition in which the first and second polygons are of contracted size and their planes are maximally spaced and an erected condition in which the first and second polygons are of expanded size and their planes are spaced relatively close; and

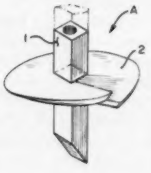
further rod means pivotally joined together and to corners of said polygons for self-locking said assembly in said erected condition, said further rod means comprising a first set of rod elements pivotally joined together at the plan view geometric center of said first polygon and extending therefrom to pivotally connect to corners of said first polygon, said rod elements of said first set being of lengths such that they lie essentially in a common plane containing said corners of said first polygon when said first polygon has expanded to a maximum size, said further rod means also including a second set of rod elements pivotally joined to corners of said second polygon and to intermediate portions of corresponding rod elements of said first set so that said rod elements of the second set cannot be essentially in a common plane containing the corners of said second polygon even when the assembly is in erected condition; said rod elements of said second set being of lengths between their corner-connected ends and their pivotal connections to the corresponding rod elements of said first set such that as said polygons are expanded, the rod elements of said first and secoond sets thereof interact to place all of the rod elements of said assembly under cumulative self-locking stress in said erected condition of the assembly.

4,290,245

EARTH ANCHOR

James I. Pardue, Jr., Birmingham; William M. Hornsby, Hueytown, and Henry J. Noble, III, Birmingham, all of Ala., assignors to Dixie Electrical Manufacturing Company, Memphis, Tenn.

Filed Oct. 30, 1979, Ser. No. 89,446
Int. Cl.³ F02D *5/74*
U.S. Cl. 52—157 **9 Claims**



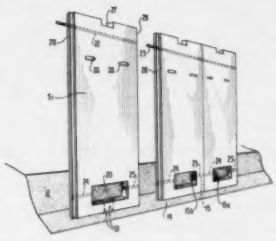
1. An earth anchor for use for embedment within the ground and for resisting pulling or compressing forces tending to urge the anchor from its implanted position, comprising, a shank portion, a continuous helical blade extending approximately a full circumference and affixed to said shank portion and designed for cutting into the ground upon anchor application, said blade having a singular linear cutting edge at the lowest extent of its flight, said linear cutting edge extending at a lagging angle from the perpendicular to the shank portion and further extending tangentially from its frontal portion thereof for effectively displacing any debris encountered by the cutting edge outwardly of the blade's circumference, said linear cutting edge lagging the perpendicular from the shank portion by an angle at least thirty degrees, and said linear cutting edge of the helical blade being bevelled downwardly for facilitating its cutting into the ground upon anchor application.

4,290,246

MULTI-PURPOSE PRECAST CONCRETE PANELS, AND METHODS OF CONSTRUCTING CONCRETE STRUCTURES EMPLOYING THE SAME

Arthur F. Hilsey, 6409 SE. Evergreen Hwy., Vancouver, Wash. 98661

Filed Nov. 22, 1978, Ser. No. 962,852
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—169.1 **46 Claims**



1. A prefabricated concrete slab adapted for placement substantially vertically in an elongated foundation ground trench at a building location adjacent to prefabricated substantially vertically positioned like-constructed such slabs in the trench to form a building structure at said building location, said prefabricated concrete slab having means providing for a positive fixed horizontal and vertical anchoring of said slab into said foundation ground trench, after said prefabricated concrete slab is aligned in abutting relationship with other such slabs in said foundation ground trench, by a pour of flowable anchoring material filling said ground trench, said means comprising an opening of elongated rectangular shape adjacent one end of said slab, said rectangular opening being positioned in said slab for disposition entirely below grade when said one end of said slab is placed in the trench, so that said rectangular opening is adapted to pass and be filled by the flowable anchoring material which is to be poured into the trench after said one end of said slab has been placed in the trench, the direction of elongation of said elongated rectangular opening in said slab being transverse to the outer vertical edges of said slab and extending substantially horizontally when said slab is placed in the trench, and said slab further defining a pair of horizontally extending aligned bores which are located respectively between the opposed outer vertical edges of said slab and the substantially vertically disposed shorter opposed edges of said rectangular opening in said slab for use in aligning said slab with adjacent ones of such slabs prior to the pouring of the anchoring material into the trench, the diameter of each of said bores being significantly smaller than the width of the shorter opposed edges of said opening, the length of said rectangular opening being greater than the combined length of said bores to permit the insertion of an elongated alignment member into said opening in said slab for horizontal passage from said opening through one of said bores in said slab and through an aligned such bore in an adjacent one of such slabs and into the rectangular opening of the adjacent one of said slabs, and the height of said rectangular opening being sufficiently great to permit the ready manipulation of the elongated alignment member by hand tools inserted into said rectangular opening during the aligning of said slab with adjacent ones of such slabs in the trench.

4,290,247

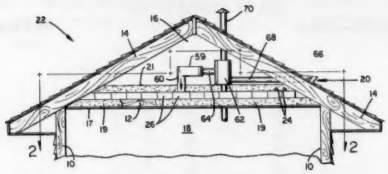
FLUID FLOW INSULATION SYSTEM

Robert J. Alderman, 812 59th St., NW., Bradenton, Fla. 33505

Filed Jul. 26, 1979, Ser. No. 60,841
Int. Cl.³ F24F *7/10*
U.S. Cl. 52—173 R **19 Claims**

1. An air insulation system for an attic and the like wherein

the attic defines an approximately horizontal support surface, said insulation system comprising an air duct system positioned on the support surface of the attic, said air duct system defining a plurality of air passages extending substantially parallel to one another and positioned closely adjacent one another, said plurality of passages being of a length and number to extend



over substantially the entire support surface of the attic, and means for inducing air to move along the lengths of each of said passages from one end to the other end of each passage in closely adjacent parallel streams so that at least some of the heat transferred from one side of the air duct system to the air passages tends to be moved with the streams of air along the lengths of the passages.

4,290,248

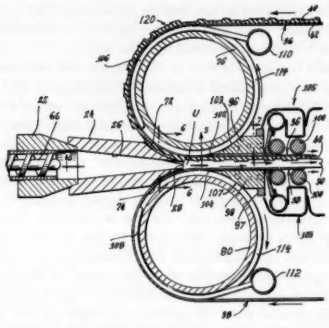
CONTINUOUS PROCESS FOR FORMING PRODUCTS FROM THERMOPLASTIC POLYMERIC MATERIAL HAVING THREE-DIMENSIONAL PATTERNS AND SURFACE TEXTURES

William J. Kemerer, 122 Derwent Dr., Pittsburgh, Pa. 15237, and Clyde W. Vassar, Cholchester, Vt., assignors to William James Kemerer, Long Beach, Calif.

Continuation-in-part of Ser. No. 538,645, Jan. 6, 1975, abandoned. This application Dec. 10, 1975, Ser. No. 639,328

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—309.16 **24 Claims**



1. A continuous impression molding process for making three-dimensional patterns on thermoplastic polymeric material comprising the steps of:

continuously providing a heated ribbon of substantially uniform thickness of said material in a plastic state at a temperature above its glass transiton temperature,

initially pressing opposed endless flexible belt molds, at least one of which has a three-dimensional rubber pattern form with abrupt changes in profile extending longitudinally of the belt and in surface contour extending transversely of the belt, against opposite sides of said heated ribbon while its temperature is above its glass transition temperature, so as to displace at least a portion of said ribbon in a continuous progressive localized pinching nip action with sufficient initial pressure for impressing a three-dimensional pattern on the heated material of said ribbon,

moving said opposed flexible belt molds and carrying said impressed material along between said opposed molds while exerting sufficient pressure against opposite sides of the material to retain said three-dimensional pattern therein,

cooling said moving opposed molds for cooling said impressed material down to a temperature in its memory retention state to cause said cooled material to retain said three-dimensional pattern, and

removing the cooled impressed material from between the opposed molds.

15. A continuous thermoplastic product made by the process of claim **1** having a three-dimensional pattern including abrupt changes in profile extending longitudinally of the product and in contour extending transversely of the product.

4,290,249

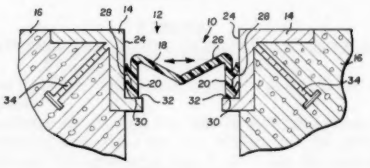
ELASTOMERIC SPRING EXPANSION JOINT-SEAL STRIP

Ronald H. Mass, Naperville, Ill., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,180

Int. Cl.³ E01C *11/04*; E04B *1/68*

U.S. Cl. 52—396 **3 Claims**



1. An expansion joint seal strip of a substantially M-shaped cross section for bridging a gap between spaced surfaces of a pair of structural slab members, said seal strip comprising:

an elongated central resilient web member of a substantially V-shaped cross section spanning the gap;

a longitudinally extending flange portion extending transversely to and along each longitudinal edge of said web member, and having one edge of each flange portion integral with an edge of said web member, and the opposite edge of each flange portion free, each flange portion having an outer side surface, and an inner side surface defining an acute angle with said web member; and

spring means embedded within said web member for expanding said web member and urging said outer side surfaces of said flange portions into sealing engagement with the spaced surfaces on the slab members when said seal strip is compressed and inserted in the gap between the slab members.

4,290,250

METHOD AND APPARATUS FOR INSULATING BUILDINGS

Stephen R. Kusenda, Knoxville, Tenn., assignor to Insulation Materials, Inc., Knoxville, Tenn.

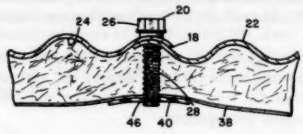
Filed Nov. 28, 1979, Ser. No. 98,181

Int. Cl.³ E04B *1/74*

U.S. Cl. 52—404 **9 Claims**

1. In an insulated building including a wall having an interior surface, a flexible layer of insulative material covering said interior surface and a plurality of aligned shaft members projecting inwardly from said interior surface through said insulative layer, the improvement comprising means for securing

said flexible layer to said wall, said securing means comprising an elongated fastener member comprising a flexible material



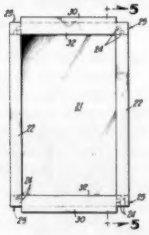
defining elongated slot means adapted to frictionally engage a plurality of said shaft members.

4,290,251

STORM SASHES AND METHOD AND APPARATUS FOR MANUFACTURING

Lawrence L. Graham, 300 Great Oak Dr., Athens, Ga. 30605

Division of Ser. No. 884,893, Mar. 9, 1978, Pat. No. 4,191,080.
This application Jul. 23, 1979, Ser. No. 59,904
Int. Cl.³ E06B *3/26*
U.S. Cl. 52—656 **4 Claims**



1. A storm sash or frame member comprising a rectangular pane formed of translucent material, pairs of opposite side channel cross section frame sections embracing opposite side longitudinal edge portions of said pane, said opposite side frame sections having lengths whereby square corner portions of the pane project beyond the ends of adjacent frame sections and remain exposed, integral locking tabs carried by the opposite ends of portions of said frame sections and lying generally in the same planes adjacent to opposite sides of portions of the square corner portions of the rectangular pane, and separately formed corner connectors for the ends of the frame sections having side walls engaging over the square corner portions of said pane and having side wall locking apertures adapted to receive and interlock with said locking tabs, said portion of said corner connectors having right angular edges abutting the end faces of adjacent parts of said portions of said frame sections when assembled with the frame sections to produce a continuous rigid channel frame entirely around the margin of said pane.

4,290,252

BASEMENT WATERPROOFING SYSTEM

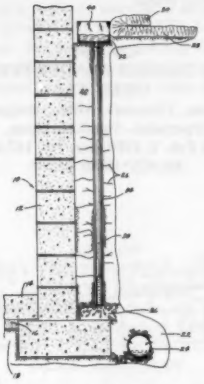
Turgut Demirel, and Richard L. Handy, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 5, 1979, Ser. No. 91,362
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—742 **8 Claims**

1. A method of waterproofing subterranean walls, comprising:

making a plurality of spaced apart vertical holes in the soil adjacent said wall but yet spaced away from said wall;

introducing a highly ionic inorganic salt solution into the bottom portion of said holes without contacting the sidewalls of said holes; and thereafter,



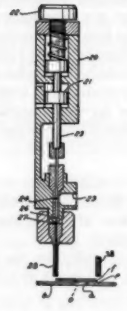
filling said bore holes and associated soil cracks with asphalt emulsion to impregnate the soil and seal the same.

4,290,253

METHOD OF PRODUCING SEALED PACKAGING CONTAINERS

Klaus Domke, and Walter Saur, both of Ditzingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stutgart, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,898
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856021
Int. Cl.³ B65B *51/02, 1/28, 3/18*
U.S. Cl. 53—410 **7 Claims**



1. A method of producing a valve-equipped packaging container to be filled with a commodity, comprising the steps of forming a bag from a flexible sheet material; sealing a bottom of the bag; forming a hole on one of the surfaces of the bag; applying to said one surface in the area of said hole two members in superimposed relation to form a valve, one of said members contacting said one surface and being preliminarily provided with an opening and having a lower surface coated with an adhesive material so as to form two substantially parallel layers surrounding said opening which becomes in registry with said hole upon applying said two members, said two layers forming a valve channel between said one member and said one surface; pressing said members to said one surface to firmly connect the valve to the bag; filling the bag with the commodity and sealingly closing the bag; and applying a noncuring sealing fluid to free ends of said channel to produce a

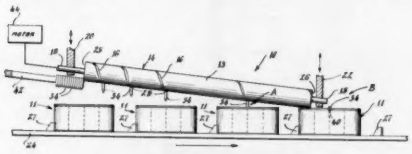
fluid film in said channel, said film being adapted to be ruptured by expanding gases which may develop in the closed bag, so as to enable said gases to escape from said bag and to thereafter inherently reseal.

4,290,254

BEVERAGE CARRIER HANDLE FEEDER AND INSERTER

William T. Brunone, Plymouth, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 1, 1980, Ser. No. 117,470
Int. Cl.³ B65B *61/14*
U.S. Cl. 53—413 **7 Claims**



6. A method of feeding handles to and inserting said handles into packages comprising the steps of:

(a) sequentially separating individual handles from a plurality of handles,

(b) linearly feeding each of said handles at a preselected rate of speed and at a preselected angular relationship with respect to a plurality of said packages being, linearly and horizontally conveyed at a preselected speed therebeneath,

(c) aligning each said handles being fed with a different one of said packages, respectively, being conveyed by synchronizing said preselected rate of speed of feeding said handles with said preselected speed of conveying said packages, and

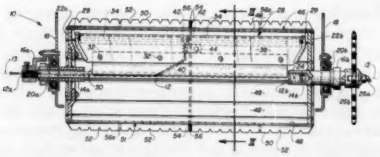
(d) inserting each of said handles in said different one of said packages, respectively, at a preselected position, wherein said steps of periodically separating individual handles, feeding said handles at a preselected speed and inserting each of said handles into a different one of said packages, respectively, is accomplished by rotating a pair of spaced apart cylindrically-shaped members positioned at said preselected angular relationship with respect to said packages, each member having a spiral groove therein for engaging said handles therebetween.

4,290,255

FEED ROLL APPARATUS

Wayne B. Martenas, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Oct. 1, 1980, Ser. No. 192,784
Int. Cl.³ A01D *41/12*
U.S. Cl. 56—10.2 **5 Claims**



1. A feed roll apparatus comprising:

a shaft;

a feed roll rotatably mounted on said shaft; said feed roll having spaced apart end plates interconnected by a tubular peripheral wall;

a plurality of elongated corrugations formed on an outer surface of said wall, said corrugations extending substantially coaxially with said shaft and protruding substantially radially outwardly from said feed roll, said corrugations having a circumferential groove formed therein substantially midway between said end plates, said groove being directed radially inward transverse to said shaft axis; and

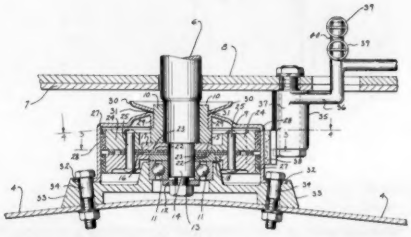
means for strengthening said tubular wall, said means being a support ring secured in said groove and extending radially outwardly from said wall surface and terminating adjacent said corrugations.

4,290,256

SINGLE CABLE CONTROL SYSTEM FOR LAWN MOWER

Lester H. Seifert, R.R. #2, Park Ave., Kiel, Wis. 53042

Filed Dec. 10, 1979, Ser. No. 101,617
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—11.3 **13 Claims**



1. A rotary lawn mower, comprising a housing, a handle connected to the housing, drive means mounted on the housing and having a drive shaft and having a throttle member on the engine for controlling the speed of the engine, said throttle member being movable between an idle position and a full throttle position, a rotary cutting blade disposed within the housing, clutch means disposed within the housing and interconnecting the drive shaft and the blade and including a clutch member connected to the blade, brake means disposed within the housing and movable between a braking position in which the brake means is engaged with said clutch member to stop free rotation of said clutch member and said blade and a released position in which the brake means is out of contact with said clutch member, throttle operating means mounted on the handle and movable between an idle position and a full throttle position, cable means interconnecting the throttle operating means and the throttle member, biasing means for biasing the brake means to the braking position, brake actuating means connected to the cable means for moving the brake means to the released position on movement of the throttle operating means from the idle position toward the full throttle position to thereby enable said clutch means to provide a driving connection between the drive shaft and the blade, and an extendible member connected to said cable means between said brake actuating means and said throttle member, movement of the throttle operating means from the idle position toward the full throttle position causing said extendible member to extend without a corresponding movement of said throttle member to thereby insure that the brake means is released before the engine speed is increased.

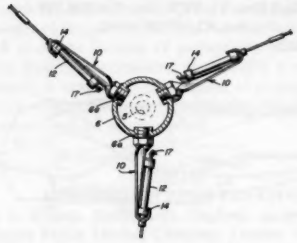
4,290,257
ROTARY ASSEMBLY FOR CUTTING GRASS AND OTHER VEGETATION

Alfred A. Frantello, 26 Rainbow Dr., Satellite Beach, Fla. 32937

Continuation-in-part of Ser. No. 105,080, Dec. 19, 1979, which is a continuation-in-part of Ser. No. 932,991, Dec. 15, 1978, abandoned. This application Aug. 20, 1980, Ser. No. 179,873

Int. Cl.³ A01D *50/00, 53/00*

U.S. Cl. 56—12.7 **7 Claims**



1. A balanced rotary cutting assembly for attachment to the lower end of the drive-shaft of a housed rotary power mower for cutting grass and other vegetation, said balanced rotary cutting assembly comprising

(a) a centrally-bored hub member;

(b) a plurality of equi-distantly spaced radially-extending arms carried by said centrally-bored hub member;

(c) each of said equi-distantly spaced radially-extending arms being provided adjacent its outer end with an axially offset boss having a longitudinal bore extending thr[illegible]ough;

(d) a readily replaceable section of flexible cutt[illegible]line extending through the longitudinal bore of the ax[illegible]lly offset boss adjacent the outer end of each of said radia[illegible]y-extending arms and projecting therefrom into proximi[illegible]y with the inner surface of the aforementioned housing of the rotary power mower; and

(e) each of said readily replaceable flexible cutting lines possessing an axially enlarged inner end of sufficient diameter to prevent its axial movement into the adjacent end of the longitudinally bored boss on the radially-extending arm by which it is carried.

4,290,258
LAWNMOWER BLADES

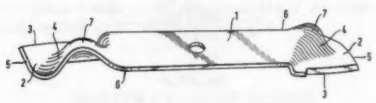
Hans Göbler, Kirchstrasse 8, 5231 Woldert, Fed. Rep. of Germany

Filed May 22, 1980, Ser. No. 152,310

Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921249

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—295 **4 Claims**



1. In a lawnmower blade arranged to cut in a substantially horizontal position, of the kind which comprises a strip of metal having a substantially flat central region and end portions provided with cutting edges on opposite sides of said blade, said cutting edges being at a level lower than said central region in the position of operation and extending substantially parallel to the surface of said central region and being joined by transitional zones to the surface of said central region, said transitional zones extending, at the ends of said blade, from said cutting edges to the trailing edges of said blade respectively and being progressively shorter with increasing distance from said ends, the improvement comprising: providing a hump positioned near and spaced from each end of said blade, each of said humps merging with its associated adjacent transitional zone and being directed towards said trailing edges of said blade respectively, the humps enhancing the grass ejecting force of the blade without substantially increasing the air rupture and its attendant noise when the blade is in use.

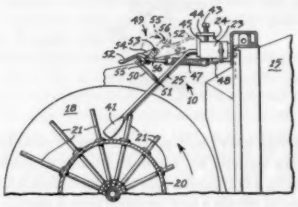
4,290,259
KNIFE ASSEMBLY FOR STRIPPING AUGER DRUM OF COMBINE HEADER

Charles V. Parvin, Rte. 1, Mulkeytown, Ill. 62865, and James Harris, Rte. 1, Box 121A, Rutherford, Tenn. 38369

Filed Mar. 4, 1980, Ser. No. 127,113

Int. Cl.³ A01D *89/00*

U.S. Cl. 56—364 **7 Claims**



1. In a combine header having an auger rotatable about a transverse axis and including a central drum portion having axially spaced feed fingers projecting radially therefrom and a feed opening behind the central drum portion for communication with the throat of a combine, a cutting apparatus comprising:

(a) a mounting frame,

(b) means supporting said mounting frame in operative position above and in fixed relation to said feed opening,

(c) a knife frame,

(d) journal means supporting said knife frame on said mounting frame in operative position for pivotal movement about a transverse axis,

(e) a plurality of transversely spaced, elongated knife bars, each knife bar having a fixed end portion fixed to said knife frame, and an opposite free cutting end portion,

(f) each of at least some of said knife bars lying between the radial planes of rotation of a pair of adjacent feed fingers,

(g) each of said cutting end portions being co-linear with said knife bar,

(h) a first stop element on said knife frame,

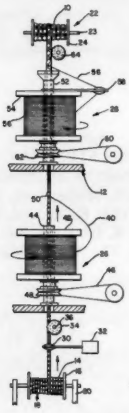
(i) a second stop element on said mounting frame engageable with said first stop element to limit the pivotal movement of the cutting end portions of said knife bars toward the central drum portion of said auger drum to an operative position slightly spaced from the surface of said central drum portion for cutting vegetation carried around said central drum portion by said feed fingers,

(j) adjustment means operably associated with one of said stop elements to vary the position of said one stop element relative to its corresponding frame so that when said stop elements are engaged, said operative position of said cutting end portions relative to the surface of said central drum portion is varied.

4,290,260
HIGH DENIER NON-PLIED FRIEZE YARN AND METHOD OF MAKING THE SAME

Allan Wasserman, Lincoln, R.I., assignor to Felice Lowenstein, New York, N.Y. and Ronnee M. Wasserman, Providence, R.I., part interest to each

Filed Dec. 26, 1979, Ser. No. 107,405
Int. Cl.[3] D02G 3/12
U.S. Cl. 57—210 6 Claims

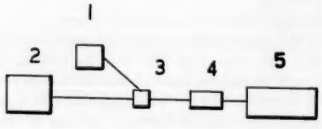


4. A relatively heavy non-plied decorative metallic, composite frieze yarn suitable for use in embroidery, sewing and the like comprising a composite core yarn including a non-metallic core yarn about which a first metallic yarn is spirally wound in a first rotational direction and over which a first non-metallic cover yarn is spirally wound in a second opposite rotational direction, said composite core yarn having a second metallic yarn spirally wrapped thereover in one rotational direction and a second non-metallic cover yarn spirally wrapped thereover in a second direction opposite to that of said one rotational direction.

4,290,261
NON-SPECULAR ELECTRICAL CONDUCTOR AND STEEL STRAND, AND METHODS OF MAKING

Thomas Eistrat, 1020 S. Almansor St., Alhambra, Calif. 91801

Continuation-in-part of Ser. No. 12,168, Feb. 14, 1979, Pat. No. 4,198,807, which is a continuation-in-part of Ser. No. 869,850, Jan. 16, 1978, Pat. No. 4,149,367. This application Apr. 17, 1980, Ser. No. 141,028
The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.
Int. Cl.[3] D07B 7/14
U.S. Cl. 57—223 10 Claims



1. A multi-layered stranded linear body having interior and exterior wires, such as an electrical conductor or wire rope, wherein the improvement comprises;

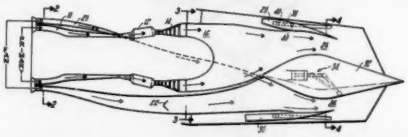
(a) the exterior wires having an electrodeposited pigment on the surfaces thereof which gives a non-specularly dulled appearance and the exterior wires being stranded over one or more interior wires;

(b) all said interior wires being free of any contaminants such as the products of abrasive blasting.

4,290,262
TWO-DIMENSIONAL PLUG NOZZLE

Thomas A. Wynosky, Madison, Conn.; Charles A. Campbell, Palm Beach Gardens, Fla., and Robert J. Mischke, Middletown, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1978, Ser. No. 968,599
Int. Cl.[3] F02K 3/06
U.S. Cl. 60—262 4 Claims

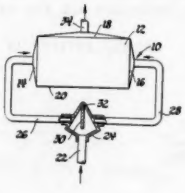


1. For a fan jet engine having a primary core section for developing a fluid working medium in an annular cross-sectional flow stream and a fan section for developing a fluid working medium in an annular cross-sectional flow stream and each stream at a given location being in concentric relationship, means for forming said stream in a rectangular cross-sectional relationship including a first ducting means for transitioning the primary core fluid working medium in a two-dimensional nozzle configuration, a second ducting means for transitioning the fan fluid working medium in a separate two-dimensional nozzle configuration, means for changing the geometry of each of said two-dimensional nozzle configurations independently of each other and a central plug centrally disposed at the downstream end of said fan jet engine and having wall portions, said wall portions defining a wall of each of said two-dimensional nozzles.

4,290,263
DIESEL ENGINE EXHAUST TRAP PARTICULATE DISTRIBUTION AND INCINERATION BALANCING SYSTEM

Gamdur S. Mann; Dilip V. Tendulkar, both of Flint, and William J. Parker, Burton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1979, Ser. No. 102,966
Int. Cl.[3] F01N 3/02
U.S. Cl. 60—311 3 Claims



1. A diesel engine exhaust system with particulate collection and incineration balancing means comprising

a particulate trap having a plurality of generally parallel inlet passages open at both ends and a plurality of generally parallel outlet passages open at least at one end, said inlet passages extending adjacent said outlet passages and being separated therefrom by porous walls through which exhaust gases may pass from the inlet to the outlet passages and capable of retaining substantial amounts of combustible particulates filtered from the exhaust gases upon such passage,

inlet duct means including multiple inlet ducts connected to supply to said inlet passages exhaust gases which may be heated for the incineration of collected particulates, with the opposite ends of each inlet passage being supplied by separate ducts,

exhaust duct means including at least one outlet duct connected with the open ends of said outlet passages to receive filtered exhaust gas therefrom, and

valve means in at least one of said inlet and exhaust duct means and arranged to differentially vary the flow through the walls separating the various inlet and output passages of the particulate trap, the distribution of particulates to or the burning of particulates on the trap walls being thereby concentrated sequentially at various points whereby a more even distribution of particulates to or a more complete removal of particulates from the trap at all locations may be accomplished.

4,290,264

STIRLING CYCLE APPARATUS

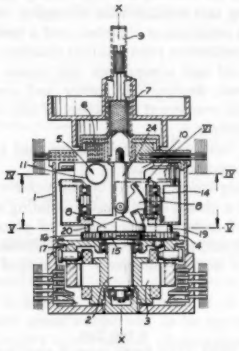
Derrick J. Haines, Letchworth, England, assignor to British Aerospace Public Limited Company, London, England

Filed Jan. 19, 1979, Ser. No. 4,923

Claims priority, application United Kingdom, Jan. 21, 1978, 2487/78

Int. Cl.³ F02G *1/06*

U.S. Cl. 60—518 **15 Claims**



1. Stirling cycle apparatus, including:

working means for cyclically compressing or expanding a working fluid, displacing means for cyclically displacing the working fluid, rotatable shaft means, and drive means operatively associating the working means and the displacing means with the shaft means;

the working means including a plurality of piston/cylinder units symmetrically disposed with the axis of reciprocation of the pistons tangential to an imaginary circle lying in a plane normal to the rotational axis of the shaft means and centred upon said rotational axis.

4,290,265

MASTER CYLINDER DEVICE

Toshifumi Maehara, Chichibu, and Kazuo Kawase, Kuki, both of Japan, assignors to Akebono Brake Industry Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 933,904, Aug. 15, 1978, abandoned. This application Nov. 14, 1979, Ser. No. 94,050

Claims priority, application Japan, Aug. 31, 1977, 52-115692[U]

Int. Cl.³ B60T *11/06*

U.S. Cl. 60—561 **8 Claims**

1. A master cylinder device for a vehicle in which a valve mechanism for reducing and controlling rear brake pressure with respect to front brake pressure is accommodated within a piston of the master cylinder comprising:

a driving piston and a floating piston which are slidably moved within a cylinder body;

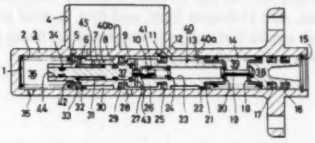
a first liquid chamber formed between said driving piston and said floating piston;

a second liquid chamber formed between said floating piston and an end wall of said cylinder body;

a third liquid chamber connectable to a rear brake;

a stepped cylinder formed within said floating piston and having a large diameter portion and a small diameter portion;

a stepped piston having large and small diameter portions sealingly slidable respectively in said large and small



diameter portions of said stepped cylinder, which has said small diameter portion facing one of said first and second liquid chambers and said large diameter portion facing said third liquid chamber;

a valve mechanism disposed in a passage having a valve seat which provides a communication between the other of said first and second liquid chambers and said third liquid chamber, said valve mechanism including a valve member cooperating with said valve seat, said valve mechanism being closed in response to movement of said stepped piston towards said one of said first and second liquid chambers, said stepped piston being separate from and relatively movable with respect to said valve member; and

a spring for biasing said stepped piston towards said third liquid chamber to open said valve mechanism.

4,290,266

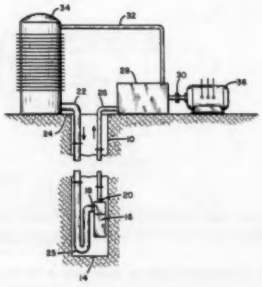
ELECTRICAL POWER GENERATING SYSTEM

Terrance M. Twite, Shellhorn, and Wilmer S. Huston, both of Brownsville, Minn. 55919

Filed Sep. 4, 1979, Ser. No. 72,125

Int. Cl.³ F03G *7/00*

U.S. Cl. 60—641.2 **4 Claims**



1. A geothermal power generating system comprising:

(a) a bore hole extending into the earth to a subterranean location where the temperature is a predetermined desired value;

(b) an evaporator unit disposed proximate the bottom of said bore hole and having a liquid refrigerant inlet port and a gaseous refrigerant outlet port;

(c) an elongated U-shaped loop of tubular conduit having

one end thereof coupled to said liquid refrigerant inlet port and the bottom of said loop being at a predetermined level below the effective level of said evaporator unit;

(d) a gas driven turbine unit disposed on the earth's/earth-/surface proximate said bore hole and having a high pressure inlet and a lower pressure outlet;

(e) a condenser unit disposed on the earth's surface proximate said bore hole;

(f) a first conduit means coupling said condenser unit to the other end of said U-shaped loop of tubular conduit;

(g) a second conduit means coupling said gaseous refrigerant outlet port of said evaporator unit to said high pressure inlet of said turbine; and

(h) a third conduit means coupling said lower pressure outlet of said turbine unit to said condenser unit, said evaporator unit, said U-shaped loop, said first, second and third conduit means and said condenser unit all being in a hermetically sealed relationship.

4,290,267

METHOD FOR RECOUPING COMBUSTION HEAT

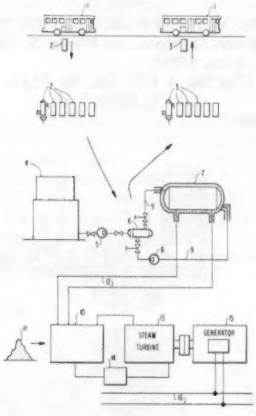
Helmut Buchner, Wendlingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,103

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705145

Int. Cl.³ F01K *17/00*

U.S. Cl. 60—648 **25 Claims**



1. An installation for the regenerative heat-exchange with a exchange of heat-absorbing body means in a heat-emitting flow and a heat-emitting body means in a heat-absorbing flow, characterized in that the body means are constructed as metal hydride storage means, the heat-emitting flow is exhaust gases of combustion of an internal combustion engine in a motor vehicle, the heat-absorbing flow is a stationary heating means, and in that the storage means are interchangeable so as to be removed, replaced and stored.

4,290,268

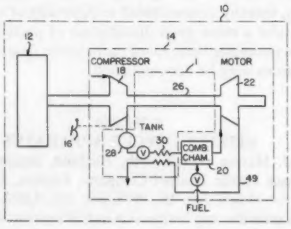
VEHICLE BRAKING AND KINETIC ENERGY RECOVERY SYSTEM

Frank E. Lowther, Buffalo, N.Y., assignor to Purification Sciences, Inc., Geneva, N.Y.

Continuation-in-part of Ser. No. 926,237, Jul. 20, 1978, Ser. No. 890,465, Mar. 27, 1978, abandoned, Ser. No. 908,155, May 22, 1978, Pat. No. 4,228,659, Ser. No. 920,445, Jun. 29, 1978, abandoned, and Ser. No. 879,969, Feb. 21, 1978, abandoned. This application Sep. 15, 1978, Ser. No. 942,820

Int. Cl.³ F01K *15/00*

U.S. Cl. 60—668 **23 Claims**



1. A method for braking a vehicle comprising the steps of:

(a) powering said vehicle with an engine including a compressor, a combustion chamber, and a motor for converting hot combustion products into rotation of a shaft, and at least one of said compressor and motor being a rotary sliding vane device, said motor and compressor being operatively connected to a wheel of said vehicle for rotation therewith;

(b) braking said vehicle by loading said compressor and therefore said wheel, and

(c) recovering kinetic energy of said vehicle during braking thereof in a closed circuit gas circulating system for a gas capable of undergoing a change of phase, compressing said gas in said closed circuit during braking to change its phase, and storing said gas in its changed phase state for later use.

4,290,269

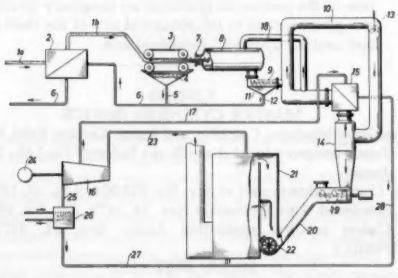
PROCESS FOR THE EFFICIENT CONVERSION OF WATER-CONTAINING ORGANIC MATERIALS AS FUELS INTO ENERGY

Bengt O. A. Hedström, Gothenburg, and Claes G. S. Svensson, Kungälv, both of Sweden, assignors to MoDo-Chemetics AB, Ornskoldsvik, Sweden

Filed Oct. 9, 1979, Ser. No. 83,194

Int. Cl.³ F01K *21/00*

U.S. Cl. 60—670 **13 Claims**



1. A process for the efficient conversion of water-containing

organic material as a fuel into heat and electric energy, including drying the material to convert it into a fuel and then combusting the fuel to recover electric energy at low cost; which comprises heating the material in a steam vessel in which the material is enveloped in steam at superatmospheric pressure that is heated by heat exchange with steam derived from combustion of the fuel at a higher pressure and higher temperature than the steam in the vessel; recycling water driven from the material as steam and forming excess steam in the vessel at least in part to the material in the vessel and condensing it directly thereon; mechanically separating water from the material, and then drying the material to convert the material into a fuel; combusting the dry fuel in particulate form, thereby generating steam at high pressure; utilizing the high pressure steam to operate a turbine; which in turn operates a generator; converting the energy content of the steam into electric energy; and recycling at least part of the steam from the turbine for heat exchange with the steam in the steam vessel.

4,290,270

MARINE PROPULSION UNIT

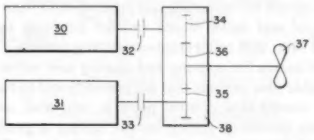
Wilhelm Meeh, Friedrichshafen, Fed. Rep. of Germany, assignor to Motoren-und-Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 13, 1979, Ser. No. 57,284

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830730

Int. Cl.³ B63H *23/00*

U.S. Cl. 60—716 **4 Claims**



1. A marine propulsion unit which includes at least two diesel engines, a propeller means and means for selectively coupling the diesel engines to the propeller so as to enable the propulsion unit to be operated with less than all of the engines during a medium speed range and to be operated with all engines during higher speed ranges, characterized in that one of the propeller means and coupling means is constructed so that the propeller means absorbs a maximum constant output of those diesel engines operated in the medium speed range with a full amount of fuel being injected to those medium speed operated diesel engines and so that in the higher speed ranges with all engines operating, higher speeds of the propeller means are attained by an increase of the speeds of the diesel engines with exceeding a maximum constant output and with a reduction in the amount of fuel being injected.

4,290,271

NITROGEN LIQUID TO GAS CONVERTER

Donald W. Granger, Sunset, La., assignor to Waukesha-Pearce Industries, Inc., Houston, Tex.

Filed Mar. 6, 1980, Ser. No. 127,620

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—53 **10 Claims**

1. A nitrogen liquid to gas converter comprising,

a liquid nitrogen inlet,

a nitrogen pump actuated by a first hydraulic motor connected to the inlet for pumping liquid nitrogen,

a nitrogen-air heat exchanger connected to the nitrogen pump for adding heat to the nitrogen and converting the liquid nitrogen to gaseous nitrogen,

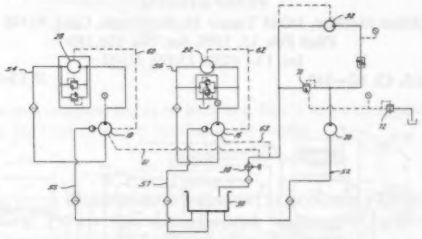
an air fan for passing air over the heat exchanger and actuated by a second hydraulic motor,

hydraulic pump means for actuating the first and second motors,

diesel engine for driving said hydraulic pump means,

an engine exhaust-air heat exchanger positioned in the air upstream from the nitrogen heat exchanger for heating the air,

an engine water-air heat exchanger positioned in the air



upstream from the nitrogen heat exchanger for heating the air,

a hydraulic oil-air heat exchanger connected to the hydraulic pump means and first and second hydraulic motors and positioned in the air upstream from the nitrogen heat exchanger for heating the air,

means connected to the hydraulic pump means for increasing the heat of the hydraulic fluid for heating the nitrogen.

4,290,272

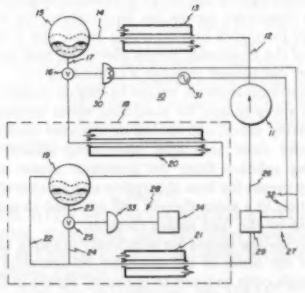
MEANS AND METHOD FOR INDEPENDENTLY CONTROLLING VAPOR COMPRESSION CYCLE DEVICE EVAPORATOR SUPERHEAT AND THERMAL TRANSFER CAPACITY

Himanshu B. Vakil, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 18, 1979, Ser. No. 58,462

Int. Cl.³ F25B *00/00*

U.S. Cl. 62—114 **11 Claims**



1. A method for controlling the capacity and evaporator superheat of a vapor compression cycle device comprising the steps of:

compressing vapor of a miscible multicomponent working fluid mixture comprising at least two refrigerants having different boiling points, circulating the mixture vapor through a condensing heat exchanger, circulating mixture from the condensing heat exchanger to a high pressure accumulator, circulating a controlled amount of the mixture from the high pressure accumulator to a first evaporator stage in response to a sensed household thermal demand, circulating mixture from the first evaporator stage to a low pressure accumulator, controlling the circulation of the mixture from the low pressure accumulator to a

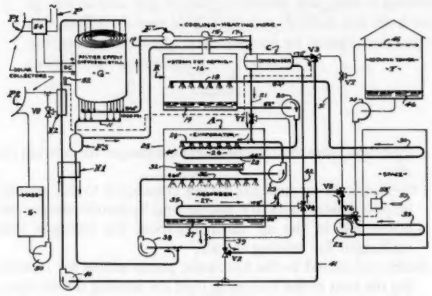
second evaporator stage in response to the degree of mixture vapor superheat sensed at a point intermediate the second evaporator stage inlet and a compressor, and circulating the mixture exiting from the second evaporator stage to the compressor.

4,290,273

PELTIER EFFECT ABSORPTION CHILLER-HEAT PUMP SYSTEM

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91348

Filed Feb. 13, 1980, Ser. No. 121,249
Int. Cl.³ F25B *15/00, 21/02*
U.S. Cl. 62—148 **20 Claims**



1. A space conditioning system for buildings and the like, and including;

a generator means with feed means and for producing high temperature high pressure motive water separate from an absorbent solution thereof,

a means converting said motive water into high temperature high pressure steam,

a steam-jet refrigeration means having a booster ejector operated with said steam and drawing a secondary water vapor from a chamber, there being spray means discharging chilled water into said chamber for both evaporation and precipitation to a sump therein,

the booster ejector discharging steam through a first channel of a condenser means for liquification and discharge of water through a first diverting valve, and a second channel of the condenser means absorbing heat into a heating water discharged through a control valve,

an evaporator-absorber means having an evaporator section with spray means for receiving water through said first diverting valve, and having an absorber section with heat transfer coils and with circulating means discharging strong solution from the generator means and through spray means for heat absorption and precipitation of weak solution to a sump therein and returned to said generator means by the feed means therefor,

first circulating means for selectively drawing chilled water from the sump of the steam-jet refrigeration means and through coils exposed to the spray means in the evaporator section and thereafter through space cooling coils and recirculated therefrom through the spray means in the chamber of the steam-jet refrigeration means,

recirculating means for selectively drawing water from a collecting tray in the evaporator section and discharging the same from the spray means therein,

a second diverting valve from the heat transfer coils in the absorber section and discharging between the second channel of the condenser and sump of said absorber section,

a recirculating valve from the sump of the absorber section for alternate opening to the generator feed means and to the second channel of the condenser through said second diverting valve,

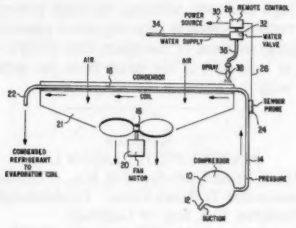
and a pair of controlling valves at the inlet and outlet of a second circulating means through space heating coils and said heat transfer coils in the absorber section.

4,290,274

LIQUID SPRAY DEVICE WITH ADAPTIVE DUTY CYCLE

Donald D. Essex, 1620 Georgia Ave., North Augusta, S.C. 29841

Filed Jul. 16, 1979, Ser. No. 57,975
Int. Cl.³ G05D *23/32*
U.S. Cl. 62—157 **7 Claims**



1. Apparatus for cooling the refrigerant-containing vessels of a refrigeration or air conditioning unit, which comprises:

valve means including an inlet port for receiving a cooling fluid from a source and an outlet port for delivering said cooling fluid when said valve means is open;

nozzle means for receiving said cooling fluid from said outlet port of said valve means and for directing said cooling fluid onto said refrigerant-containing vessels;

control means for opening and closing said valve means for variable time periods that are proportional to the temperature sensed at a control point in said unit, said control means including timing means having a predetermined period that consists of an on cycle and an off cycle, the time periods of said on and off cycles within said predetermined period being variable in proportion to said temperature, wherein said timing means includes first timer means for producing an output signal during said on cycle, said control means responsive to said output signal for opening said valve means; and

means for sensing said temperature of said unit at said control point comprising a thermistor means whose resistance decreases as said temperature increases, wherein said first timing means includes means responsive to a decrease in resistance of said thermistor means for decreasing the time period of said output signal, whereby said valve means is opened for a longer period of time during said predetermined period in response to an increase in said temperature.

4,290,275

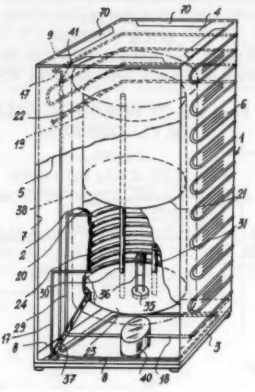
HEAT PUMP WATER HEATER

Paulus J. Disco, Induno Olona; Ernesto Quargentan, Mainate, and Pietro Santalucia, Laveno Mombello, all of Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1979, Ser. No. 75,478
Claims priority, application Italy, Sep. 13, 1978, 27609 A/78
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **5 Claims**

1. A water storage heater comprising a heat pump including a compressor, a condenser and an evaporator connected in a closed circuit; a vertically disposed inner hot-water container having a cold water inlet and a hot water outlet, said condenser being arranged in heat relationship with a wall of said inner

container; and an outer shell spaced from and surrounding said inner container to provide an interspace, at least a part of said



outer shell being constituted by said evaporator, said outer shell being provided with apertures.

4,290,276

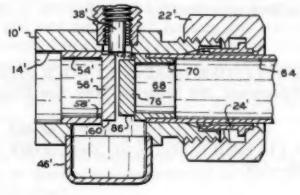
VALVE WITH FRANGIBLE CLOSURE

Steven M. Knowles, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 1, 1979, Ser. No. 90,396

Int. Cl.³ F25D *19/00*

U.S. Cl. 62—299 **17 Claims**



16. In combination, a flexible conduit precharged with a pressurized refrigerant, said conduit having cylindrical inner and outer surfaces and ends, a tubular body comprising a tubular sleeve having an axial passage, an outer end, a cylindrical portion sealingly received within said conduit inner cylindrical surface and a shouldered portion having a radial shoulder engaging a conduit end, said shouldered portion having a cylindrical outer surface comprising the maximum dimension of said sleeve and of a diameter substantially equal to the diameter of said conduit outer surface, a valve element defined upon said sleeve outer end sealing said sleeve passage and axially extending from said sleeve outer end and radially exteriorally accessible, and a frangible web supporting said valve element upon said body.

4,290,277

AIR-CONTROLLED NEEDLE LATCH CLOSING FOR KNITTING MACHINE

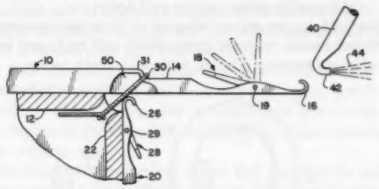
Robert Valliere, Laconia, N.H., assignor to Scott & Williams, Incorporated, Laconia, N.H.

Filed Jun. 21, 1979, Ser. No. 50,801

Int. Cl.³ D04B *9/24, 15/08*

U.S. Cl. 66—24 **4 Claims**

1. A method of closing the open latch of a latch needle, comprising the steps of moving the latch needle to a clear position, and thereafter directing a blast of air away from the open latch of the needle to create a low pressure area generally adjacent the latch wherein an inrush of air to fill the low pres-



sure area impinges the open latch and flips it to a closed position, the blast of air not impinging the needle.

4,290,278

MACHINE FOR PRODUCING STITCH BONDED FABRIC

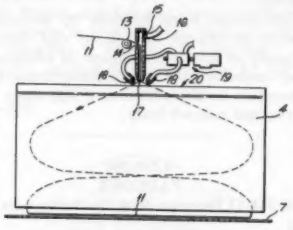
Kenneth Porter, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 21, 1979, Ser. No. 96,475

Claims priority, application United Kingdom, Sep. 25, 1979, 7933141

Int. Cl.³ D04B *23/06, 23/08, 23/10, 23/12*

U.S. Cl. 66—84 A **8 Claims**



1. A machine for producing stitch bonded fabrics comprising means for supplying a layer of warp threads, means for continuously supplying a weft thread, means for supplying a plurality of stitching threads and means for stitching the warp layer and weft thread together with said stitching threads, the improvement being that the means for supplying and laying the weft threads consists of a pair of closely spaced plates, means for forwarding an individual thread towards the plates and means for imparting an oscillatory motion to the forwarded thread before it passes between the plates.

4,290,279

PADLOCK WITH INTERCHANGEABLE CYLINDER

Aaron M. Fish, Hampstead, and Jean-Paul Dausseing, Montreal, both of Canada, assignors to Unican Security Systems, Ltd., Montreal, Canada

Filed Jul. 14, 1980, Ser. No. 168,117

Int. Cl.³ E05B *67/22*

U.S. Cl. 70—38 A **10 Claims**

1. A padlock comprising:

a body having a pair of parallel bores therein adapted to receive the legs of a shackle;

a shackle having a pair of parallel legs slidably received in said bores;

locking means positioned within said body to secure said shackle in said body when said legs are depressed into said bores;

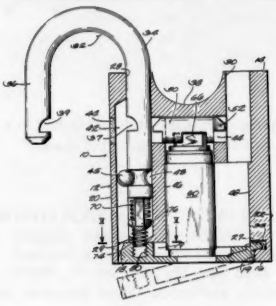
interchangeable means for releasing said locking means, comprising

key-operated means operable by turning movement of a key to effect the release of said shackle from said lock-

ing means to allow one of said legs to withdraw from said body, said body having an opening to receive said interchangeable means to permit positioning said interchangeable means within said body;

detachable cover means adapted to close said opening;

fastener means operable from within said body and engageable in fastening relation with said cover means;



tool means carried by the other of said shackle legs within said body,

said tool means being movable by movement of said shackle to engage and move said fastener means, whereby to selectively engage or disengage said fastener means relative to said cover means for selective connection or disconnection of said cover means relative to said padlock body.

4,290,280

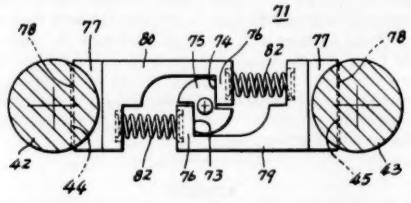
PADLOCK

Sun Y. Yun, 561-12 Yeonnam-dong, Seodaimoon-ku, Seoul, Rep. of Korea

Filed Mar. 23, 1979, Ser. No. 23,280

Int. Cl.[3] **E05B** *67/22*

U.S. Cl. 70—38 A **2 Claims**



1. Padlock comprising a body case as a frame block having a cylinder assembly space and shackle holes, said cylinder assembly space having securing members extending thereinto;

a semi-circular shackle having a center portion and two ends slidable through said shackle holes;

a locking member unit housed in said space and having a cam and locking bars operatively associated with said cam, each said bar having a locking edge for co-acting with one of said shackle ends, and a rear portion, springs, said locking bars being biased into engagement with said shackle ends by the action of said springs against said rear portions, said cam having L-shaped stopping points into which said rear portions are biased;

a cylinder assembly unit operatively associated with said cam for lockingly operating said locking member unit;

a closing member; and

screw means for securing said cylinder assembly to one securing member in said cylinder assembly space and for securing said closing member to another securing member in said frame block.

4,290,281

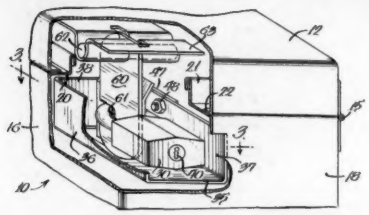
LOCK SYSTEM

Howard L. Knaack, and Kenneth F. Weger, Jr., both of Cary, Ill., assignors to Knaack Manufacturing Company, Crystal Lake, Ill.

Filed May 27, 1980, Ser. No. 153,841

Int. Cl.[3] **E05B** *67/38*

U.S. Cl. 70—54 **18 Claims**



1. A lock system for a tool box having a body and a movable cover and utilizing a padlock having a body and shackle comprising,

means within the tool box mounting the padlock inside the tool box with the shackle captured against substantial movement to be inaccessible from outside the tool box, and the padlock body supported for movement and having a key insertion end thereof exposed for access from outside the tool box, and a lock bracket on the movable cover positionable in mechanically interlocked association with the shackle when the cover is closed for capture by the padlock upon locking thereof.

4,290,282

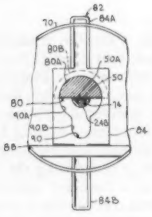
SINGLE CYLINDER DEADBOLT LOCK MECHANISM

Carl H. Wildenradt, 209 Moncada Way, San Francisco, Calif. 94127

Filed Aug. 21, 1979, Ser. No. 68,463

Int. Cl.[3] **E05B** *13/00, 17/04, 55/06;* **F16D** *11/06*

U.S. Cl. 70—129 **2 Claims**



1. A lock mechanism comprising,

a lock cylinder at one side thereof,

a thumbturn at the opposite side thereof,

a latch bolt operated by rotation of said cylinder,

releasably engagable means for interconnecting said thumbturn and latch bolt,

means selectively operable from said opposite side of the lock mechanism movable between thumbturn enabling and disabling positions for conditioning said releasably engagable means for non-coupling relationship between said thumbturn and latch bolt in the thumbturn disabling position thereof,

said releasably engagable means including,

a tubular shaft on said thumbturn formed with a slot in one side thereof,

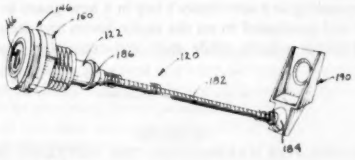
spindle bar means coupled to said latch bolt and having an end portion with a flat thereon coaxially aligned with said thumbturn shaft and extending past said slot therein, and detent means maintained by said selectively operable means in said shaft slot in non-relatively movable engagement with both said thumbturn shaft and flat on said spindle bar means for nonrotatably connecting said thumbturn shaft and spindle bar means in the thumbturn enabling position of said selectively operable means.

4,290,283

HUB CAP LOCK DEVICE

Clovis Labrecque, 2135 Comtois, Sillery, Province of Quebec, Canada

Continuation-in-part of Ser. No. 843,967, Oct. 20, 1977, abandoned. This application Nov. 15, 1978, Ser. No. 960,773
Claims priority, application Canada, Oct. 5, 1977, 288172
Int. Cl.³ B65D *55/14*
U.S. Cl. 70—167 **14 Claims**



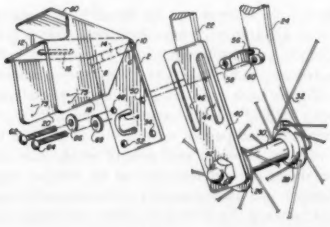
1. A hub cap lock device adapted to be installed upon a stud projecting from the hub disc of a vehicle wheel; the hub cap having an aperture therein, comprising: a hollow tubular housing having an internal cavity in registry with said aperture of said hub cap, a connecting rod having one end engagedly mounted in said one end of said housing and the other end engagedly mounted to a bracket means attached to said stud, cap means mounted at the opposite end of said housing, said cap means including a flange portion having a dimension slightly larger than the aperture in the hub cap and a bore slightly greater than said housing so that said housing may extend therein; and lock means engagedly received in said bore and in said cavity of said housing for locking said cap means to said housing to thereby prevent removal of the hub cap outwardly of said wheel.

4,290,284

LOCKING DEVICE FOR SPOKED WHEEL VEHICLES

Edward E. Nicksic, 1318 W. Oregon, Phoenix, Ariz. 85013

Filed Apr. 21, 1980, Ser. No. 142,262
Int. Cl.³ B62H *5/16*; B62K *25/02*; E05B *71/00*; F16B *41/00*
U.S. Cl. 70—233 **11 Claims**



1. A locking device for locking a spoked wheel of a spoked wheel vehicle, the spoked wheel being rotatably mounted upon a threaded axle, the threaded axle being attached to a frame member of the vehicle, said locking device comprising in combination:

a. a hasp including a first member having a staple projecting from one side thereof, said staple being formed to permit the passage of a shackle of a padlock therethrough, said hasp also including a second member hinged to said first member and having a slot located opposite said staple, said staple extending through said slot when said second member is folded over said first member;

b. a first threaded nut attached to said first member for threadedly engaging the threaded axle upon which the spoked wheel is rotatably mounted and preventing detachment of the threaded axle from the frame member of the vehicle; and

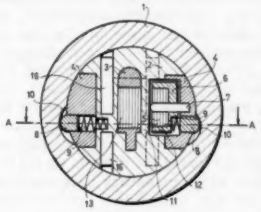
c. attaching means coupled to said first member for releasably attaching said first member to the frame member of the vehicle to prevent rotation of said threaded nut, access to said attaching means for effecting release of said first member from the frame member of the vehicle being prevented when said second member is folded over said first member.

4,290,285

CYLINDRICAL LOCK WITH A MAGNETIC BODY

Romvari Bela, Pomaz, and Kakonyi Gyula, Budapest, both of Hungary, assignors to Elzett Müvek, Budapest, Hungary

Filed Dec. 8, 1978, Ser. No. 967,592
Claims priority, application Hungary, Dec. 17, 1977, 2538
Int. Cl.³ E05B *47/00*
U.S. Cl. 70—276 **9 Claims**

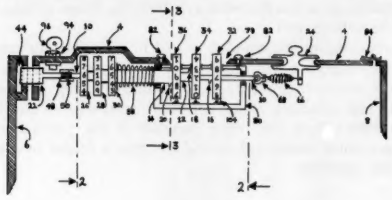


1. A cylinder lock comprising: a lock body having a cylindrical throughbore and two longitudinally extending grooves in the internal surface of the throughbore; and a lock cylinder mounted in the throughbore for rotation therein between a locking position and an unlocking position and comprising a longitudinally extending key passage and magnetically actuatable means coactive with the grooves to prevent rotation from the locking to the unlocking position and responsive to the insertion of a suitable magnetic key in the key passage to enable rotation thereby from the locking to the unlocking position including a plurality of magnetic bodies, means mounting the magnetic bodies on both sides of the key passage for rotation about an axis perpendicular to the longitudinal axis of the cylinder to a unique angular position when the suitable key is inserted wherein, the mounting means have recesses therein which are longitudinally aligned in two lines when the magnetic bodies are in their unique position, two blocking laths slidably mounted on either side of the key passage alignable with and receivable in the grooves when the lock cylinder is in the locking position to enable movement into a blocking position therein and alignable with and receivable in the recesses when the magnetic bodies are in their unique positions to enable movement into an unblocking position therein and means urging the blocking laths outwardly from the lock cylinder into the blocking position.

4,290,286
COMBINATION LOCK

Andrew E. Rae, 103 Cumberland Ave., Willow Park, Guilford, Surrey, England

Filed Nov. 8, 1979, Ser. No. 92,290
Claims priority, application United Kingdom, Nov. 14, 1978, 44324/78
Int. Cl.³ E05B 37/02
U.S. Cl. 70—285 12 Claims

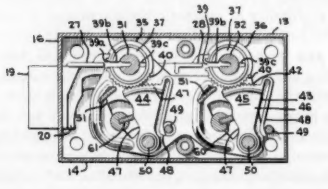


1. A combination lock comprising at least two coaxially arranged elongate members, first and second rotatable combination dial members for each elongate member, an abutment member on each elongate member, a bolt which is adapted to slide backwards and forwards in the direction of alignment of the elongate members, and a bolt-operating member, each first combination dial member being fixed to its elongate member and each second combination dial member being rotatable with respect to its elongate member, and each second combination dial member having a central aperture for receiving the elongate member and a slot for receiving the abutment member, the combination lock being such that when the code set on all the second rotatable combination dial members agrees with the code set on all the first rotatable combination dial members each abutment member can move into the slot on its second combination dial member to allow each elongate member to move through its second member for allowing withdrawal of the bolt, and the combination lock including locking means which is spring biased into engagement with the first rotatable combination dial members and which prevents unintended rotational movement of the first rotatable dial members and therefore unintended loss of the code set on the first combination dial members whilst permitting backwards and forwards movement of the first combination dial members when the elongate members are moved backwards and forwards through the second combination dial members.

4,290,287
DOUBLE CHANGEABLE KEY LOCK FOR SAFE DEPOSIT BOXES AND THE LIKE

James P. Peppard, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Aug. 28, 1979, Ser. No. 71,352
Int. Cl.³ E05B 25/00
U.S. Cl. 70—355 12 Claims

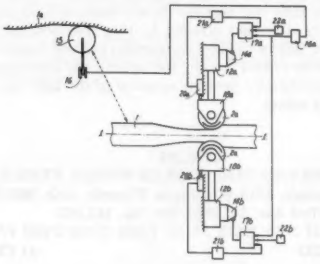


1. A changeable multiple key lock for safe deposit boxes and the like, comprising a lock case, a locking bolt including an integral bolt plate slidably movable in said case between projected locking and retracted unlocking positions and having a pair of longitudinally spaced fence members projecting therefrom, first and second stacks of peripherally gated tumbler wheels rotatably supported about respective parallel center axes in the path of longitudinal unlocking movement of said fence members to bar retraction of said fence members from the projected locking position, the tumbler wheels having gating recesses for accommodating said fence members to accommodate retraction of said bolt to unlocking position, first and second sets of key operable sector levers pivotally mounted on respective pivot posts and having gear teeth couplings respectively with the two stacks of tumbler wheels and having key follower surfaces to be engaged by portions of a guard key and renter key inserted into the lock and rotated to unlocking position to drive the associated tumbler wheels to unlocking position, and said pivot posts for said first and second sets of sector levers having means mounting them eccentrically in the lock case and having change key receiving openings therein for rotation of said posts pivot to positions withdrawing the first and second sets of sector levers to decoupled positions relative to their associated tumbler wheels by a change key to free the sector levers to assume new positions corresponding to a new renter's key or a new guard key introduced and positioned to set the sector levers and their associated tumbler wheels while they are decoupled from each other.

4,290,288
DEVICE FOR NARROWING THE BREADTH OF A SHEET SPRING MATERIAL IN AN APPARATUS FOR MANUFACTURING A TAPER LEAF SPRING

Mitsushige Kawakubo; Yoshihiro Sakai, and Akira Ohno, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed May 30, 1979, Ser. No. 43,837
Claims priority, application Japan, May 30, 1978, 53-64618
Int. Cl.³ B21B 37/14, 1/20
U.S. Cl. 72—7 4 Claims



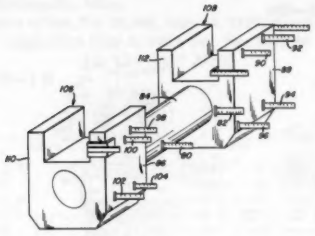
1. A device for narrowing the breadth of a sheet spring material in an apparatus for manufacturing a taper leaf spring which comprises the following: for performing rolling for breadth narrowing to both sides of a sheet spring material prior to taper rolling of both ends of said spring sheet material, a pair of work rolls for said breadth narrowing, means to regulate the interval between said pair of work rolls, a template to determine the interval between said pair of work rolls, means to detect the shape of said template as an electric signal and transmit same as mechanical energy to the means for regulating the interval between the work rolls, means to detect variations in the regulation of the interval between said work rolls as electric signals, compare them with electric signals based on variations indicated in the shape of the templete, determine errors and give correcting signals to the means for regulating the interval between the work rolls, and means to give tension to a sheet spring material and simultaneously control bending of the sheet spring material during processing work.

4,290,289

SPACIAL ALIGNMENT METHOD FOR ROLLING MILL ROLLS AND CHOCKS

Alfred J. Capriotti, Falls Township, Bucks County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1980, Ser. No. 121,858
Int. Cl.[3] B21B *31/16;* B21C *51/00*
U.S. Cl. 72—31 23 Claims



1. In a rolling mill of the type having a housing for selectively providing both lateral and vertical support for a plurality of substantially vertically aligned rolls and associated support chocks contained therein, a method of aligning each of the rolls such that their axes of rotation are substantially parallel, said method comprising:

determining the spacial orientation of each of the lateral chock face planes with respect to the axis of rotation of their associated rolls; and

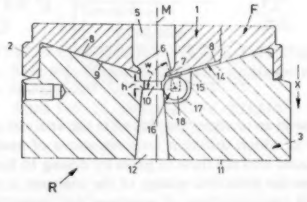
selectively placing correcting spacing elements between the lateral chock face planes and their lateral support within the rolling mill to laterally adjust the chock face plane and correspondingly, the axis of rotation of the associated roll so that each axis of rotation of each roll is substantially parallel to the axis of rotation of each of the other rolls.

4,290,290

PROCESS FOR EXTRUDING A COMPOSITE SECTION, A DIE FOR THIS PURPOSE, AND THE RESULTANT COMPOSITE SECTION

Alfred Wagner, Steisslingen, and Adolf Ames, Hilzingen-Duchtlingen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 887,317, Mar. 16, 1978. This application Nov. 9, 1979, Ser. No. 92,934
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712366
Int. Cl.[3] B21C *23/22;* B29F *3/00*
U.S. Cl. 72—256 7 Claims



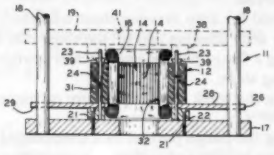
1. A process for extruding a composite metal section through a shape-giving opening in a die, said composite comprising a beam-like section, in particular a beam-like section made of a light-weight metal, and a facing of at least a part of at least one of the surfaces of the beam-like section in the form of a strip of a different metal, which comprises producing the beam-like section by extruding a billet through a die while at the same time passing the facing strip through the shape-giving opening in the die such that the facing strip is metallically bonded to the beam-like section, wherein the facing strip is fed on a moving surface positioned adjacent to the shape-giving opening of the die and plastically deformed while in contact with said moving surface such that the facing strip does not contact the non-moving surface of the die.

4,290,291

APPARATUS FOR MAKING DYNAMOELECTRIC MACHINE STATORS

Richard D. Burns, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 835,294, Sep. 21, 1977, Pat. No. 4,188,712. This application Nov. 5, 1979, Ser. No. 91,082
Int. Cl.[3] H02K *15/02*
U.S. Cl. 72—316 3 Claims



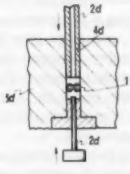
1. Apparatus for use in the manufacture of a bolt-down stator comprising a stack of laminations having a number of conductor accommodating slots, a plurality of mounting bolt holes, and a central bore concentric with the bolt hold locations wherein the dimensional variations between the mounting bolt holes and the central bore are less than eleven thousandths of an inch; the apparatus comprising: a frame; a pair of relatively movable members supported by said frame that simulate ultimate mounting means and mounting areas; press means, supported by said frame, for moving the relatively movable members together and for applying forces to the stack of laminations that simulate ultimate stator mounting forces for a preselected period of time; alignment pins carried by one of said movable members for entering the bolt holes wherein the pins are accurately dimensioned to closely fit the bolt holes and wherein the pins have a diameter that is not more than about three thousandths of an inch smaller than the diameter of the bolt holes; and means, supported by said frame, for shaping the bore of the stack of laminations within the preselected period of time while the stator mounting forces are being simulated by said means for moving and for applying forces, and while said alignment pins are disposed within bolt holes of the laminations.

4,290,292

MANUFACTURE OF ROTATABLE IGNITION FILES OR FLINT WHEELS

Yushin Yoneda, 1788, Mebuki, Noda City, Chiba Prefecture, Japan (278)

Filed Aug. 30, 1979, Ser. No. 71,553
Int. Cl.[3] B21D *31/02*
U.S. Cl. 72—330 5 Claims



1. A method of manufacturing rotatable ignition files or flint

wheels, for example for lighters, comprising the steps of: cutting elongate wire stock of gauge appropriate to the desired diameter of the wheel into blanks of suitable size; applying a series of press operations to the blanks, as cut, by means of respective punches and dies to champfer or round off the peripheral edges of the blanks, to provide axial mounting holes, and to harden the respective surfaces of the blanks; and treating the circumferential surfaces of the respective blanks being formed to provide friction surfaces.

4,290,293

METHOD FOR DEEP DRAWING

Ronald J. Selines, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 14, 1979, Ser. No. 103,440
Int. Cl.³ B21D *22/20*
U.S. Cl. 72—342 **10 Claims**

1. A method for deep drawing sheet wherein (i) the sheet is formable by deep drawing and (ii) the sheet is in the form of a blank having a flange portion and a center portion comprising the following steps;

(a) cooling the blank to a temperature no higher than about minus 50° C.;

(b) heating the flange portion to a temperature higher than the center portion and sufficient to establish a temperature differential between the flange portion and the center portion of about 40° C. to about 150° C.; and

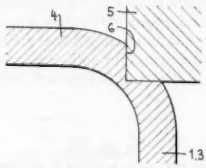
(c) drawing the blank into a concave drawing die using a mating convex punch, the center portion being initially at a temperature no higher than about 0° C. and the drawing being effected at a speed sufficient to maintain the temperature differential established in step (b).

4,290,294

METHOD FOR PRODUCING AEROSOL CAN TOPS

Werner Diemi, Bern, Switzerland, assignor to Styner & Bienz AG, Niederwangen, Switzerland

Filed Mar. 7, 1979, Ser. No. 18,369
Claims priority, application Switzerland, Mar. 8, 1978, 2506/78
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—348 **3 Claims**



1. A method for producing an aerosol can top, wherein a plate is deep-drawn to form a funnel-shaped member having a cylindrical portion closed at one end by a contiguous central portion, then the central portion is removed, and then the rim of the opening is curled, the improvement wherein the removal of the central portion comprises the steps of:

providing a tool having a compression edge;

axially pressing said tool edge into the plate for forming therein at the boundry between the cylindrical portion and the central portion a groove solely by compression of the material of the plate by said compression edge, thereby producing compressive stresses in the plate along said impressed groove; and

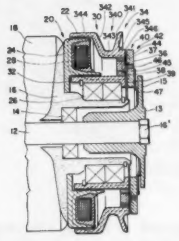
tearing off the central portion along said impressed groove leaving said cylindrical portion with a compressively prestressed open end which thereafter may be outwardly curled without splitting.

4,290,295

METHOD OF MAKING V-GROOVED PULLEY ASSEMBLY

Hisanobu Kanamaru; Hideo Tatsumi; Akira Tohkairin, and Kosaku Sayo, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1979, Ser. No. 68,563
Claims priority, application Japan, Aug. 23, 1978, 53-103314
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—356 **7 Claims**



1. A method of making a V-grooved pulley assembly, the method comprising the steps of:

forming a thick wall portion including one side wall portion of the assembly and a tubular thin wall portion which extends from said thick wall portion and includes the other side wall portion of the assembly from a tubular member by means of cold-working, and

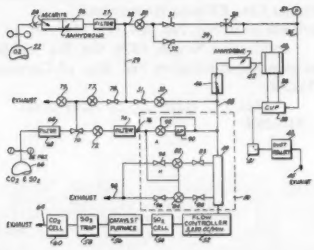
expanding said tubular thin wall portion so as to form a V-groove of the pulley assembly.

4,290,296

METHOD AND APPARATUS FOR GAS DOSING FOR LINEARIZATION

Roger L. Bredeweg, and George J. Sitek, both of Stevensville, Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Nov. 16, 1979, Ser. No. 95,508
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—1 G **22 Claims**



1. For use in an analyzer employed in the analysis of gaseous specimens in which different concentrations of specimen gas are introduced into the flow of gases by dosing to linearize the signals from the detection system of the analyzer, a system for dosing such concentrations of specimen gas comprising:

a source of specimen gas;

a manifold having a conduit coupled in the gas flow path of the analyzer;

means coupled to said manifold for metering specimen gas from said source to said conduit;

means for detecting the quantity of gas metered into the analyzer; and

circuit means coupled to said detecting means for determining a scaling factor for a known concentration of specimen

gas metered into the analyzer which scaling factor corrects for non-linearities in the detection system of the analyzer.

4,290,297

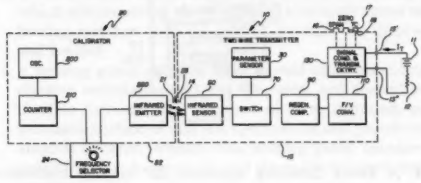
OPTICALLY COUPLED CALIBRATOR FOR TRANSMITTERS

Loren A. Anderson, Farwell, Minn., assignor to Rousemount Inc., Minneapolis, Minn.

Continuation of Ser. No. 38,446, May 14, 1979, abandoned. This application May 8, 1980, Ser. No. 147,734

Int. Cl.³ G01P *21/00*

U.S. Cl. 73—1 R **22 Claims**



1. Apparatus for calibrating a two wire DC transmitter of the type having a sensor which provides a time varying sensor signal representative of a parameter to be sensed, current control means for controlling, as a function of time varying signals received, total DC current in two wires which couple the transmitter to an external DC power supply and an external series connected load, the apparatus comprising:

a calibrator having:

an oscillator means for generating a known time varying oscillator signal;

light emitting means coupled to the oscillator means for providing a time varying light signal in response to the time varying oscillator signal; and

opening means providing for passage of light from the calibrator; and

the two wire transmitter having:

light sensor means for receiving the time varying light signal from the calibrator and for providing a time varying calibration signal as a function of the time varying light signal;

selection means for selectively providing the time varying calibration signal or the time varying sensor signal to the current control means; and

adjustment means for adjusting the total DC current from the transmitter when the time varying calibration signal is selected to provide a known relationship to the known time varying oscillator signal, thereby calibrating the transmitter.

4,290,298

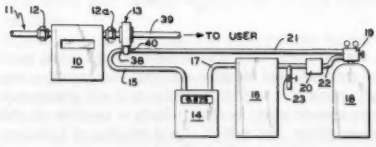
SYSTEM FOR IN SITU METER TESTING

Asbjorn M. Severson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1980, Ser. No. 123,584

Int. Cl.³ G01F *25/00*

U.S. Cl. 73—3 **7 Claims**



1. A system for in situ testing of fluid meters comprising:

a self-contained, dual-position valve disposed in the supply line in series with and downstream of the meter to be tested, said valve having a first position wherein the inlet and outlet openings of the valve are in communication with the upstream and downstream openings of the supply line such that the fluid is enabled to pass straight through the valve along the supply line, and a second position wherein the inlet and outlet openings of the valve are in communication with auxiliary ports not connected with each other; and

means for connecting said auxiliary ports in series with a test or calibration unit.

4,290,299

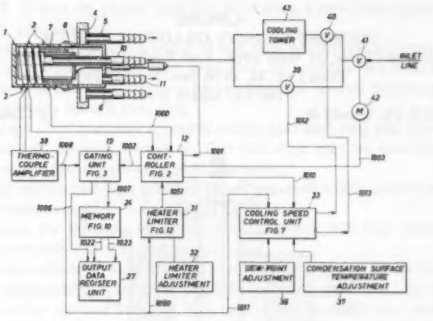
APPARATUS FOR CONTINUOUS TEMPERATURE MEASUREMENT OF THE DEW POINT OF FLUE GASES

Mikhail A. Pozin, 2960 Lake St., Apt. 143, Lake Charles, La. 70601, and Mikhail B. Serkh, Posledny Per 15, Apt. 30, Moscow 10392, U.S.S.R.

Filed May 10, 1978, Ser. No. 904,603

Int. Cl.² G01N *25/02*

U.S. Cl. 73—17 A **19 Claims**



1. Apparatus for continuous temperature measurement of the dew point of flue gases which apparatus is adapted to be installed in a stream of flue gases and comprises:

(a) a condensation surface means which is adapted to be installed in a flue gas stream which surface means forms a condensate on the exposed surface thereof dependent at least in part on its temperature and the gases flowing in the stream of flue gases;

(b) sensor means operative at said condensation surface means for determining the presence or absence of condensate formed on said surface means;

(c) heating means for said condensation surface means for supplying heat thereto for raising the temperature thereof;

(d) cooling means for cooling said condensation surface means;

(e) temperature sensing means for sensing the temperature of said condensation surface means;

(f) control means connected to said sensor means wherein said sensor means provides a signal at least partly dependent on an increase or decrease in the condensate thereon for forming a control signal indicative of the increase and decrease in surface condensate;

(g) comparator means for comparing the signal from said control means against a reference signal wherein the output thereof is a signal applied to said heating means and said cooling means for controlling the operation thereof to vary the temperature of said condensation surface means which variation in temperature alters the rate at which condensate is formed on said condensation surface means to achieve a controlled rate of change in condensate, and wherein the absence of change in condensate is indicative of the dew point in the flue gases flowing past said condensation surface means;

(h) output means connected to said surface temperature sensing means for forming an output signal proportionate to the surface temperature detected by said surface temperature sensing means;

(i) memory means connected to said output means for receiving and storing the output signal thereof proportionate to the surface temperature measured by said surface temperature sensing means; and

(j) memory control means connected to said memory means and additionally connected to said comparator means which control means is operated by the comparison determined by said comparator means, and wherein said comparator means determines the occurrence of a balance in the formation of additional condensate on said condensation surface means and the loss of condensate which balance causes formation of a signal by said comparator means supplied to said memory control means for operation of said memory means to store and hold the signal proportionate to surface temperature as representative of the dew point temperature of the flue gases flowing past said condensation surface means.

4,290,300

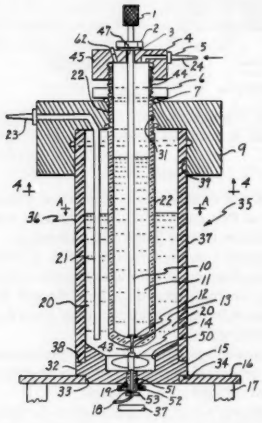
SUCROSE DENSITY GRADIENT SYSTEM

Joseph Carver, 31 West Blvd., East Rockaway, N.Y. 11518

Filed Oct. 18, 1978, Ser. No. 952,283

Int. Cl.[3] G01N *9/18*

U.S. Cl. 73—32 R **9 Claims**



1. In a device for preparing an exponential or linear sucrose or similar type gradient liquid column within a test tube or centrifuge tube, having two chambers concentric one within the other, each of which may be pressurized or vented to atmosphere, an outer chamber provided with a mixing bar, an inner chamber provided with a valve stem, both chambers permitting a variable volume charge, to form a light concentration sucrose in one chamber and a heavy concentration sucrose in the other chamber, to provide a linear gradient as a liquid column within the test tube, with the linear or exponential gradient formed, the introduction of a biological material sample containing one or more components of varying molecular weight or size to be layered atop the formed gradients to be used for quick and convenient determination of the density or specific gravity or the molecular size and weight of the various biological components, due to the distribution of the biological components over the sucrose or linear exponential gradient as they find a position in the liquid column and deposit upon the layered sucrose or float in stratified suspension through the gradient.

4,290,301

KNOCK DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINE

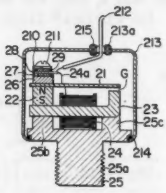
Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 19, 1979, Ser. No. 95,673

Claims priority, application Japan, Apr. 18, 1979, 54/47560

Int. Cl.[3] G01L *23/22*

U.S. Cl. 73—35 **5 Claims**



1. A knock detecting apparatus for internal combustion engines comprising:

magnetic path means including reed means of magnetic material disposed to vibrate in response to vibration of a combustion engine and at least one air gap formed in close proximity to said reed means, wherein said magnetic path means comprises two magnetic paths each including a reed member of the same length to exhibit the same resonance characteristic;

magnetic flux detecting means disposed to detect a change in reluctance of said magnetic path means caused by a change in the length of said air gap due to the vibration of said reed means, said reed means having a characteristic so as to be resonant at the frequency of knock, wherein said magnetic flux detecting means comprises two magnetic flux detectors each thereof being disposed to detect a change in the reluctance in respective magnetic paths; and

a knock detecting circuit including two integrators for integrating the output signals of said magnetic flux detectors respectively and an adder for adding the output signals of said integrators.

4,290,302

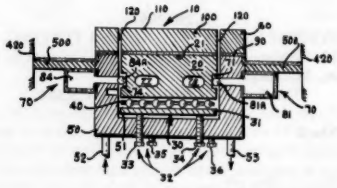
BIAXIAL SHEAR FORCE GAUGE

Clarence J. Harris, Lansdowne, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 13, 1980, Ser. No. 129,858

Int. Cl.[3] G01N *17/00*

U.S. Cl. 73—86 **10 Claims**



1. A biaxial shear force gauge for use with a test specimen made of a preselected ablative material and having a top surface and a preimeter surface, wherein said test specimen is in a high temperature gaseous flow which is capable of ablating said test specimen, and which also is capable of inducing, and of exerting on said top surface of said test specimen, a resultant shear force that comprises constituent axial and lateral forces, comprising:

a. a low inertial mounting block member having a top surface upon which said test specimen of preselected ablative material is mounted, wherein said mounting block member is free to move in axial directions and in lateral directions;

b. a bottom support assembly disposed below, and in alignment with, said mounting block member, wherein said bottom support assembly includes a bottom support member and a means for leveling said bottom support member;

c. a linear thrust ball bearing member interposed between, and in abutting contact with, said mounting block member and said bottom support member of said bottom support assembly.

d. a water-cooled container/housing having an opening in which said mounting block member, said linear thrust ball bearing member, and said support assembly are disposed and housed;

e. a housing guard member made of said same preselected ablative material as said test specimen, and shaped and sized to surround, and disposed so as to surround, said perimeter surface of said test specimen of said preselected ablative material, wherein this housing guard member is simultaneously mounted on said water-cooled container/-housing;

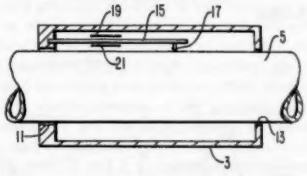
f. and, means for detecting and measuring any axial and lateral constituent forces of said resultant shearing force that are exerted on said top surface of said test specimen of said preselected ablative material by said high temperature gaseous flow.

4,290,303

APPARATUS FOR MEASURING SURFACE SCRATCHES ON A TUBE

Douglas G. Harman; Ralph E. Lambert, both of Tampa, and George W. Gruber, Largo, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 3, 1979, Ser. No. 54,515
Int. Cl.³ G01B *5/28*
U.S. Cl. 73—105 **3 Claims**



1. Apparatus for measuring a surface defect, on a tube said apparatus comprising;

a support tubularly shaped to conform to said tubular surface and being split axially to fit over said tube;

a cantilevered member having one end thereof rigidly connected to said support and a distal end biased toward said surface;

a needle fastened on said distal end of said cantilevered member;

a first strain gage affixed to one side of said cantilevered member,

a second strain gage affixed to a side opposite the one side of said cantilevered member, and

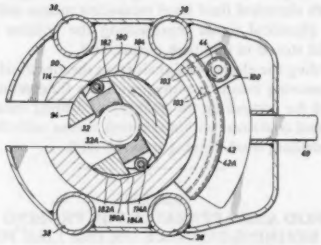
said strain gages being electrically connected together to produce an improved signal, whereby as said apparatus is traversed over said surface said needle follows said surface and defects thereon to cause said cantilevered member and said strain gages to flex and produce the improved signal, which can be calibrated to indicate the depth of the defect relative to the surface.

4,290,304

BACK-UP POWER TONGS AND METHOD

Emery L. Eckel, Odessa, Tex., assignor to Eckel Manufacturing Company, Inc., Odessa, Tex.

Filed Apr. 30, 1979, Ser. No. 34,774
Int. Cl.³ B25B *17/00*
U.S. Cl. 73—862.25 **13 Claims**



7. A back-up power tong for preventing a pipe from rotating, comprising

a cam ring affixed to a frame of said tong and having an opening therein so that said pipe may be laterally positioned within said cam ring and having first and second camming surfaces on said cam ring,

a cage plate assembly rotatable within said cam ring and having an opening therein so that said pipe may be laterally positioned in said cage plate assembly,

first and second pipe gripping heads mounted within said cage plate assembly,

means for effecting rotary motion between said cage plate assembly and said cam ring.

means affixed to said first and second pipe gripping heads for cooperating with said camming surfaces such that, upon rotary motion between said cage plate assembly and said cam ring, said first and second pipe gripping heads are caused by said camming surfaces to move inwardly thereby gripping said pipe, and

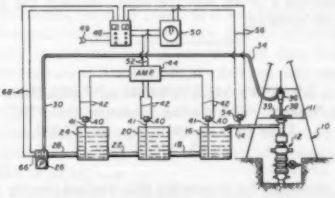
support means for releasably retaining said cage plate assembly within said cam ring, including (a) at least two hold-up brackets each rotatably mounted relative to said frame, and (b) a fluid-powered cylinder for causing rotational movement of said hold-up brackets.

4,290,305

DRILLING FLUID CIRCULATING AND MONITORING SYSTEM AND METHOD

Joseph T. Gibson, and Gerald L. Duhon, both of New Iberia, La., assignors to A. C. Company, New Iberia, La.

Filed May 29, 1979, Ser. No. 42,777
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—155 **16 Claims**



9. A method of monitoring changes in the fluid circulation of a drilling fluid circulation system, comprising:

counting the number of strokes of a drilling fluid circulation

pump for determining the volume of the drilling fluid being pumped into a well;

supporting a capacitance probe within a drilling return line to measure the liquid level of drilling fluid in said drilling fluid return line leading to storage tank means to provide an electrical signal representing the volume of drilling fluid flowing out of the well;

measuring the level of drilling fluid in storage tank means with electrical fluid level measuring means and providing an electrical signal representing the volume of drilling fluid stored in said tank means; and

recording the electrical signals from the electrical fluid level measuring means mounted with the fluid return line and tank for comparing the quantity of drilling fluid returning to and contained within said tank means with the quantity of drilling fluid flowing into the well.

4,290,306

METHOD AND APPARATUS FOR PROBING INTO A REFINING FURNACE OR THE LIKE FOR TEMPERATURE MEASUREMENT FOR SAMPLING, OR FOR BOTH

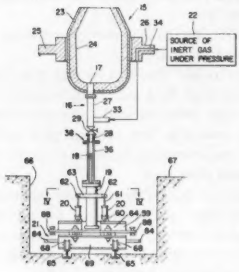
Keikichi Murakami, and Hideo Kaneko, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 29, 1980, Ser. No. 126,105

Claims priority, application Japan, Mar. 5, 1979, 54/25785; Mar. 20, 1979, 54/32520

Int. Cl.³ G01N *1/12*

U.S. Cl. 73—354 **23 Claims**



1. A method of probing into a vessel containing a high-temperature fluid material, as for measuring the temperature of the fluid material, for sampling the fluid material, or for both purposes, which method comprises:

(a) forming a probe entrance opening in the vessel in the adjacency of its bottom;

(b) constantly introducing a gas under pressure into the vessel through the probe entrance opening in order to prevent the influx of the fluid material into the probe entrance opening; and

(c) inserting a probe into the vessel through the probe entrance opening.

4,290,307

GRAVITY MEASURING APPARATUS

Lewis A. Manson, 4602 Waring, Houston, Tex. 77027

Filed Oct. 10, 1979, Ser. No. 83,351

Int. Cl.³ G01V *7/08*

U.S. Cl. 73—382 R **15 Claims**

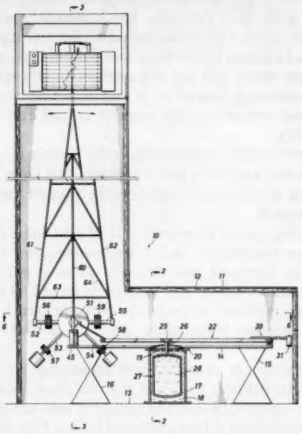
1. An apparatus for measuring time variant gravity comprising:

(a) a fixed pivot;

(b) an elongate lever arm supported by said pivot for motion thereabout, said lever arm having a specified extent laterally of the pivot when supported in a generally horizontal position relative to said pivot;

(c) a tank; and

(d) a buoyant chamber connected to said lever arm and positioned within said tank and adapted to float in a liquid



therein to move said lever arm as said chamber floats, wherein said lever arm is deflected by said chamber as it floats in said tank, and wherein an imbalance exists between said chamber and the liquid in said tank to raise or lower said chamber with time variant gravity.

4,290,308

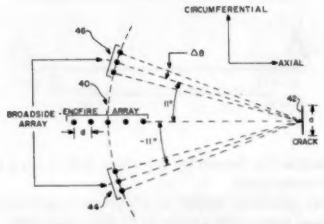
METHOD OF MONITORING DEFECTS IN TUBULAR PRODUCTS

Gary J. Dau, Palo Alto, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 17, 1979, Ser. No. 76,483

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—602 **3 Claims**



1. The method of monitoring a defect such as a crack in a product such as steel pipe comprising the steps of

(a) positioning a plurality of transducers on said product in predetermined positions relative to said defect, including a broadside array of transducers and an endfire array of transducers,

(b) applying ultrasonic waves to said product in close proximity to said defect,

(c) receiving waves reflected from said defect and generating electrical signals in response thereto, and

(d) analyzing said electrical signals to determine changes therein which are indicative of changes in said defect by providing an adaptive learning network model for said product and defect and analyzing said electric signals in accordance with said model, said model being based on

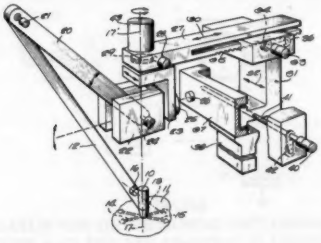
power ratios computed over several electrical signal frequency bands in a fixed frequency bandwidth.

4,290,309

DIAGNOSTIC ULTRASOUND APPARATUS HAVING AUTOMATIC ISOCENTRIC ROTATOR

Thomas F. Charlebois, Oconomowoc, Wis., and Edward J. Roswog, Boston, Mass., assignors to General Electric Company Schenectady, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,221
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—621 **3 Claims**



1. Apparatus for making ultrasound examinations of a body including carriage means mounted for moving longitudinally in the Y direction, an arm mounted on said carriage means for moving transversely in the x direction, a head mounted on said transversely movable arm for turning about a vertical axis, an articulated arm composed of pivotally connected arm sections one of which is pivotally mounted to said head and another of which has an ultrasound transducer pivotally mounted on it, said articulated arm being constrained to move in a single plane to scan said transducer along a single plane through a body and said articulated arm being swingable w said head about said vertical axis to enable selection of the scanning plane of said arm and transducer, and the improvement for automatically establishing said vertical axis about which said articulated arm swings at the same X and Y coordinates at which said transducer is located when it is over a selected isocenter on the body so said articulated arm can be swung to a selected plane without translating said transducer from said isocenter, comprising:

first motor means operable to translate said transversely movable arm in reverse directions and controller means for said motor means,

second motor means operable to translate said longitudinally movable carriage means in reverse directions to thereby shift said transversely movable arm longitudinally and controller means for said second motor means,

means for providing signals representative of the X coordinate and Y coordinate position of said transducer,

processor means having input means for said signals and being operative to use said signals to activate said controller means to cause said respective motor means to move said transversely movable arm and carriage means until said vertical axis about which said articulated arm swings has the same X and Y coordinates as said transducer, and

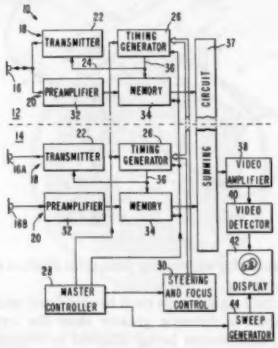
a circuit including a switch operable to cause said motor controllers to be activated.

4,290,310

ULTRASONIC IMAGING SYSTEM USING DIGITAL CONTROL

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 9, 1979, Ser. No. 55,721
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—626 **17 Claims**



1. A real-time ultrasonic imaging system comprising:

an array of transducers adapted for propagating ultrasonic energy into a body to be ultrasonically examined and for receiving reradiated sonic energy from points within said body;

a plurality of signal channels respectively including transmitter branches and receiver branches, said transmitter branches activating said transducers to propagate said sonic energy, and said receiver branches receiving electrical signals from said transducers corresponding to said reradiated energy;

a plurality of identical digital memory means each respectively associated with one of said receiver branches, for receiving and storing data indicative of the signal level of said reradiated energy received by said receiver branch;

display means for receiving the data from the memory means in each of said channels, and for combining and processing said data to effect a display of the bodily portion being examined;

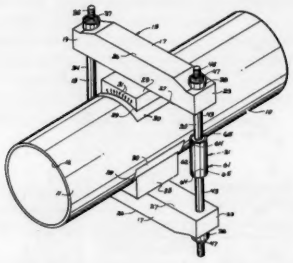
timing generator means in each signal channel connected to the transmitter branch and to the memory means associated with said channel, for activating said transducers at predetermined times of phase said transducers to enable steering and focusing of said array, and for activating said memory means and gating out the said data from said memory means at times which are delayed with respect to activation of the transducers by predetermined intervals, thereby controlling the bodily points from which said reradiated sonic energy is received in accordance with said delays, to thereby enable steering and focusing of said transducer array; and

control logic means connected to said timing generator means for enabling said signals to said memory means and said transmitter branches in each of said channels whereby said display of said bodily portion being examined is effected in real time.

4,290,311
DILATOMETER

Given A. Brewer, Marion, Mass., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 8, 1980, Ser. No. 119,709
Int. Cl.³ G01L *7/02*
U.S. Cl. 73—730 **15 Claims**



1. An apparatus for measuring diametral dilation of cylindrical pipe, comprising:

first and second rigid beams each having front and back ends spaced apart a distance greater than the exterior pipe diameter, said beams being adapted to engage the pipe intermediate their respective ends at opposite sides of the pipe with the corresponding front and back ends of the beams overlying one another and located outwardly from the pipe;

first nonextensible tensile means for tying the back ends of said beams to one another;

strain sensing means having first and second opposed ends;

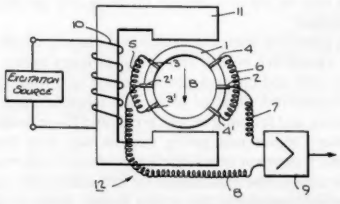
second nonextensible tensile means fixed to and extending outward from the first and second opposed ends of said strain sensing means for tying the front ends of said beams to one another in opposition to said first tensile means;

said first and second tensile means being prestressed to preload the strain sensing means.

4,290,312
SIGNAL GENERATOR FOR ELECTROMAGNETIC FLOWMETER

Tamotsu Kobayashi, Yokohama, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Jan. 22, 1980, Ser. No. 114,413
Claims priority, application Japan, Jan. 26, 1979, 54-7025
Int. Cl.³ G01F *1/58*
U.S. Cl. 73—861.12 **3 Claims**



1. In an electromagnetic flowmeter in which a fluid to be metered is conducted through a flow tube to intercept a magnetic field whereby an emf if induced in a pair of detecting electrodes at diametrically-disposed positions on the tube to yield a signal as a function of flow rate which is applied to a signal converter, a signal generator comprising:

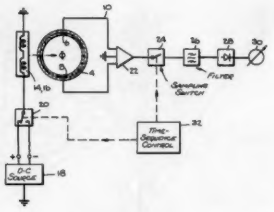
A. a set of auxiliary floating electrodes associated with each of the detecting electrodes disposed on the inner wall of the flow tube at arbitrary positions thereon at which equal potentials are present when the fluid being metered assumes a symmetrical flow rate distribution with respect to the flow tube, said auxiliary electrodes being disconnected from the detecting electrodes and from said converter; and

B. means electrically interconnecting the auxiliary electrodes of each set whereby these electrodes are rendered equipotential when the flow rate distribution is asymmetrical.

4,290,313
ELECTROMAGNETIC FLOWMETER SYSTEM

Eggert Appel, Dransfeld; Peter Nissen, Rosdorf; Gottfried Geisler, Goettingen, and Wilfried Kiene, Hann-Muenden, all of Fed. Rep. of Germany, assignors to Fischer & Porter Company, Warminster, Pa.

Filed Jan. 15, 1980, Ser. No. 112,344
Int. Cl.³ G01F *1/60*
U.S. Cl. 73—861.17 **9 Claims**



1. An electromagnetic flowmeter system including a flowmeter having electromagnets associated with a flow tube through which the fluid to be measured is conducted, the fluid intercepting a magnetic field established by the electromagnets to induce a voltage as a function of flow rate in a pair of metering electrodes mounted at opposed positions on the tube, said electromagnets being excited by a pulsatory current in accordance with a predetermined drive frequency to produce periodic magnetic flux fields resulting in a periodic metering electrode voltage, and an analyzer responsive to said metering electrode voltage to generate an output signal that is proportional to the flow rate of the fluid and is free from disturbances, said analyzer comprising:

A a sampling switch operating in synchronism with said drive frequency during sampling periods which extract from said metering electrode voltage the magnetic flux steady-state intervals thereof to produce an output train of rectangular pulses which are rich in harmonics; and

B means coupled to the output of said sampling switch to select an odd harmonic from said pulses to produce a harmonic signal which is demodulated to yield said output signal free from disturbances.

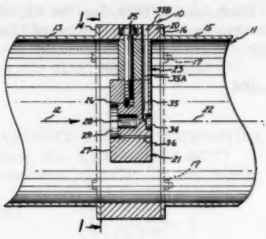
4,290,314
TARGET FLOWMETER

Robert L. Geronime, Rosemount, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Apr. 9, 1979, Ser. No. 28,575
Int. Cl.³ G01F *1/40*
U.S. Cl. 73—861.52 **10 Claims**

1. A flowmeter for determining flow of a fluid stream in a conduit having a flow axis comprising a one piece flow obstruction body having an upstream facing surface and a downstream facing surface, said upstream facing surface having a perimeter shape generally corresponding to the cross sectional shape of a conduit in which the body is to be mounted, said body being substantially imperforate and having a length measured along the flow axis less than its smallest transverse di-

mension measured generally perpendicular to the flow axis, a first bore in the body open to the upstream facing surface, a second bore in the body open to the downstream facing surface, means to mount said body in position to receive impinge-



ment of the fluid stream on the upstream facing surface, and means to sense the differential in pressures between the first and second bores to determine the relative rate of movement of the fluid stream.

4,290,315

APPARATUS FOR DETERMINING THE DIFFERENTIAL PRESSURE AND THE VOLUMETRIC FLUID FLOW IN A CONDUIT

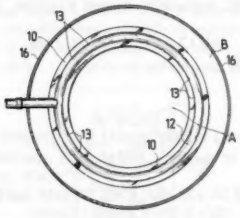
Pauli Gröberg, Espoo, Finland, assignor to Fincoil-teollisuus Oy, Vantaa, Finland

Filed Jan. 23, 1980, Ser. No. 114,577

Claims priority, application Finland, Jan. 25, 1979, 790235; Jun. 25, 1979, 792004

Int. Cl.³ G01F *1/42*

U.S. Cl. 73—861.61 **11 Claims**



1. Apparatus for determining the differential pressure and the volumetric fluid flow in a conduit, comprising:

(a) an annular plate means arranged substantially coaxially within the conduit so as to define, on one hand, an orifice in the central portion of the plate means and, on the other hand, an annular passage between outer periphery of the plate means and the inner wall of the conduit;

(b) at least two pipe loops arranged substantially coaxially with and on opposite sides of the plate means and including a series of ports for sensing the pressure at a plurality of points upstream and downstream, respectively, of the plate means, and

(c) pressure responsive means operatively connected to each series of ports for determining the differential pressure on opposite sides of plate means.

4,290,316

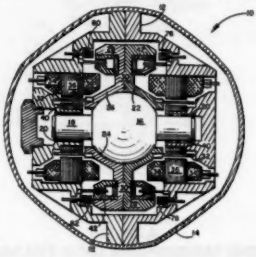
FREE-ROTOR GAS-BEARING GYROSCOPE HAVING ELECTROMAGNETIC ROTOR RESTRAINT AND ACCELERATION OUTPUT SIGNAL

Raymond Noar, Bellflower; Stanley L. Zedekar, Huntington Beach; Michael D. Albertson, Tustin; Carl W. Pointer, Placentia; Chester E. Gall, Long Beach, and Alfred B. Fuller, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 13, 1979, Ser. No. 48,301

Int. Cl.³ G01C *19/30*

U.S. Cl. 74—5.46 **20 Claims**



1. A gyroscope, comprising:

a frame;

a support ball fixed to said frame;

a rotor disposed over said support ball mounted for rotation about a spin axis of said rotor;

drive means for spinning said rotor about the spin axis; and

electromagnetic forcer means for inhibiting axial deflection of said rotor from a centered position over said support ball.

4,290,317

PRECISION DRIVE FOR ROTARY SWITCHING CONTROLS OF RECIPROCATING UNIT

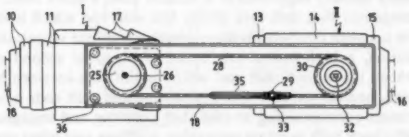
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 63,600

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1978, 2834415

Int. Cl.³ F16H *27/02, 29/02*

U.S. Cl. 74—89.2 **4 Claims**



1. A drive for rotary switching controls of an injection molding machine capable of producing a precise, backlach-free translation of lineal relative movements between two units of said machine into corresponding angular displacements of the moving member of a rotary switching signal giver, such as, for example, the wiper of a rotary potentiometer, thereby controlling switching actions, such as the starting and/or stopping of relative movements between the two machine units, the switching controls drive comprising in combination:

a length of timing belt forming a closed loop;

two belt rollers which are supported and journalled on a first one of the two machine units, on rotational axes which are perpendicular to the direction of relative movement of the machine units and rigidly spaced in such a way that the rollers carry the timing belt in a taut oblong loop and at

least one belt run is oriented parallel to the movement direction;

means for longitudinally resetting the rigid spacing between the two belt rollers;

means for rotationally connecting one of the two belt rollers to said rotary switching signal giver;

a follower clamp arranged on the parallel-oriented belt run of the timing belt, the follower clamp serving as a belt buckle by holding both extremities of the timing belt length in a longitudinally preloaded locking connection; and

means for fixedly attaching the follower clamp to the second one of the machine units.

4,290,318

OPERATING MECHANISM OF A TRANSFER UNIT

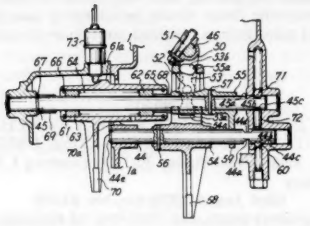
Takashi Ookubo, and Yukiyoshi Sasabe, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 27, 1979, Ser. No. 107,597

Claims priority, application Japan, Dec. 29, 1978, 53-164229

Int. Cl.[3] **G05G** *5/10, 9/12;* **B60K** *17/34*

U.S. Cl. 74—477 **3 Claims**



1. An operating mechanism of a transfer unit including a first and a second shift rods which are parallel with each other and axially slidably supported in a transfer case, a drive condition changeover first shift fork on the first shift rod which is shiftable between two wheels drive position and four wheels drive position, a high-neutral-low speed changeover second shift fork on the second shift rod which is shiftable between high speed, neutral and low speed positions, said shift rods having recesses corresponding to said shift positions and engageable with check balls to retain respective positions, one other recess formed on each surface of the shift rods and opposing with each other when the first shift rod is shifted to the four wheels drive position and the second shift rod is shifted to the high speed position, an interlock pin disposed between said opposing surfaces of the shift rods and extending between one surface of one shift rod and one of the recesses of the other shift rod, said shift rods being selectively shiftable to attain any one of the high speed two wheels drive, high speed four wheels drive, neutral and low speed four wheels drive conditions, characterized by said first shift fork relatively movably supported on said first shift rod, a waiting mechanism resiliently retaining said first shift fork on a predetermined position of the first shift rod, and means to prevent the second shift fork from moving when said first shift fork is in the two wheels drive position.

4,290,319

DEVICE FOR THE BALANCING OF INERTIA FORCES OF RECIPROCATING PISTON-CRANKSHAFT ENGINES

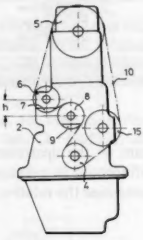
Stanislav Papez, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,760

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829042

Int. Cl.[3] **F16F** *15/26*

U.S. Cl. 74—604 **6 Claims**



1. Apparatus for partial balancing of the free Nth order inertia forces and inertia moments of a reciprocating piston engine having a crankshaft, where N is an integer, comprising a pair of eccentrically weighted balancing masses, mounted on an axial end of said engine for rotation in a plane perpendicular to the crankshaft axis, and transmission means for connecting said balancing masses to said crankshaft and causing said masses to rotate in opposite directions at a rotational speed N times the speed of said crankshaft.

4,290,320

CONTINUOUSLY VARIABLE TRANSMISSION MECHANISMS

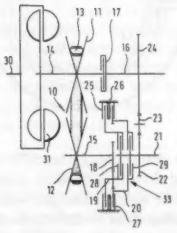
Randle L. Abbott, Tamworth, England, assignor to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft, Bad Homburg, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 5,978

Claims priority, application United Kingdom, Jan. 21, 1978, 02523/78

Int. Cl.[3] **F16H** *37/00, 3/44*

U.S. Cl. 74—689 **6 Claims**



1. A continuously variable transmission mechanism comprising

a variator having input and output sheaves of variable diameters and a flexible band connecting the sheaves together,

an input shaft co-axial with the input sheave,

an output shaft co-axail with the input shaft,

clutch means for selectively connecting said input shaft to said output shaft to provide a direct drive therebetween,

an epicyclic gearset to be driven from the output sheave and

comprising elements constituted by a sun gear, a planet carrier having planet gears and an annulus,

an output shaft from the epicyclic gearset,

a reduction drive from the output of the epicyclic gearset to said first mentioned output shaft,

control members for said epicyclic gearset selected from brakes and clutches for controlling the gearset to drive the output shaft thereof from the output sheave selectively in any one of a reduction forward drive, a direct drive with the gearset locked up and a reverse drive.

4,290,321

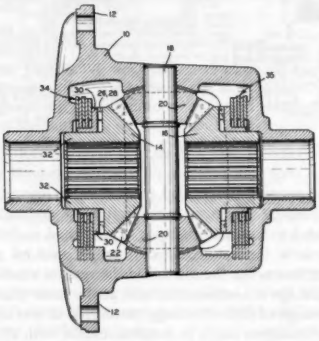
VARIABLE LOCK DIFFERENTIAL

Denney R. Wilson, Rte. 4, Ossian, Ind. 46777

Filed Jun. 25, 1979, Ser. No. 51,626

Int. Cl.³ F16H *1/44*

U.S. Cl. 74—711 **6 Claims**



1. In a differential including limited slip locking means and a pair of side gears one of said side gears including a back face having a cam surface, said differential further including an annular drive flange rotatable in coaxial relationship with said side gear, said flange having a cam surface thereon mateable with the cam surface of said side gear, said flange being positioned intermediate said locking means and said side gear such that as said gear is rotated relative to said flange, said side gear cams said flange against said locking means, an improvement comprising a variable pressure angle comprising a curvilinear profile in one of said cam surfaces whereby a varied bias ratio is achieved as drive torque is varied on said side gear.

4,290,322

ELECTRONIC TRANSMISSION CONTROL

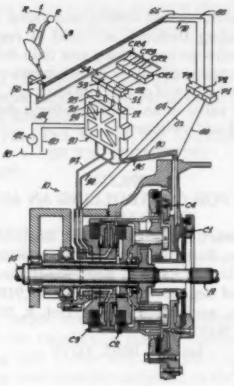
Thomas W. Huitema, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed May 25, 1979, Ser. No. 42,514

Int. Cl.³ F16H *3/74, 57/10*

U.S. Cl. 74—752 A **16 Claims**

1. In a multi-speed power transmission having an output shaft, an input shaft, a plurality of engageable fluid pressure-actuatable friction devices for connecting said output shaft to said input shaft and providing a plurality of rotational speeds for the output shaft in a given direction, and a control system for said transmission, said control system including a speed selector circuit, a plurality of fluid valve means responsive to each selector circuit, each adapted to actuate one of said friction devices, and pressure transducer means associated with each said friction devices for providing an individual indication of fluid pressure operating on each of said friction devices, said speed selector circuit comprising: an electric power source, a plurality of fluid valve actuating means each operably associated with one of said fluid valve means, speed selector switch means for energizing from said power source a predetermined number of said fluid valve actuating means, fluid pressure responsive holding means individually responsive to each of said pressure transducer means for maintaining a previously energized fluid valve actuating means in an energized state until such time when a subsequently energized fluid valve



actuating means has caused fluid pressure operating on the associated friction device to reach a predetermined value, whereby the power transmission shifts from one speed to another without delay due to the actuation and de-actuation of said friction device.

4,290,323

APPARATUS FOR CONTROLLING THE CLOSING LIMIT OF A CARBURETOR THROTTLE VALVE

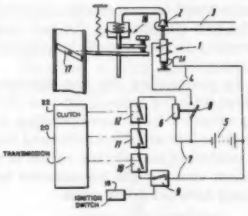
Reinhard Gospodar, Eichelkamp 36, 3180 Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 788,029, Apr. 15, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,819

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617560

Int. Cl.³ B60K *21/00, 23/00*

U.S. Cl. 74—860 **7 Claims**



1. In a motor vehicle having an engine, an ignition switch, a manually-actuated clutch and a manually actuated transmission, said engine including an intake manifold and a carburetor with a throttle valve for controlling the supply of fuel-air mixture to said intake manifold by said carburetor, a device for continuously varying the closing limit of said carburetor throttle valve as a function of vacuum, which device makes said continually-varying-closing limit operation dependent upon discreet conditions of said ignition-switch, said clutch and said transmission, comprising:

vacuum-actuated means for continuously varying the closing limit of said throttle valve in dependence upon the vacuum applied thereto;

means for connecting said vacuum actuated means to said

intake manifold thereby to provide variable vacuum pressure to said vacuum actuated means;

a valve in said connecting means for blocking said variable vacuum from said vacuum-actuated means so that said throttle valve is allowed to close to an idling speed position; and

a means for actuating and closing said valve, said actuating means including switches activated in response to said discreet conditions and at least one time delay circuit for delaying operation of said actuating means until a selected time after activation of one of said switches, thereby maintaining said valve in an open condition during transient operation of said switches.

4,290,324

APPARATUS FOR CONTROLLING AN AUTOMATIC TRANSMISSION

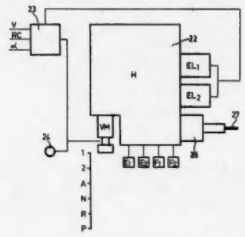
Paul Aubert, Clamart; Christian Quinton, Rueil-Malmaison, and Gerard Pannier, Bois d'Arcy, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 28, 1979, Ser. No. 79,918

Claims priority, application France, Oct. 4, 1978, 78 28436; Oct. 4, 1978, 78 28437

Int. Cl.³ B60K *41/10*

U.S. Cl. 74—866 **29 Claims**



1. A device controlling a multi-stage automatic transmission for an engine-driven vehicle, with three forward drive ratios and change under torque, damped by a hydrokinetic torque converter, and one reverse drive, of the type consisting of an epicyclic gear train actuated by two clutches and two brakes hydraulically controlled, which system comprises a hydraulic distribution unit monitored by two electric valves in order to selectively feed the two clutches and the two brakes on the basis of data concerning the running of the vehicle fitted with the transmission, comprising:

control means for controlling the two electric valves in response to three different states of the two electric valves for providing selective feeds corresponding respectively to each of the three forward drive ratios and for providing an additional control of said electric valves in response to a fourth transient state for the transmission between the third and second forward drive ratios.

4,290,325

APPARATUS FOR CONTROL OF OIL PRESSURE OPERATED TYPE TRANSMISSION FOR VEHICLE

Sadanori Nishimura, Omiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

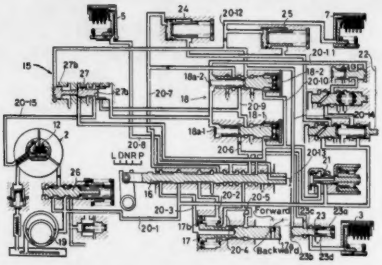
Filed May 16, 1979, Ser. No. 39,731

Claims priority, application Japan, May 29, 1978, 53-63357

Int. Cl.³ B60K *41/06, 41/10*

U.S. Cl. 74—869 **3 Claims**

1. An apparatus for control of an oil pressure operated transmission for a vehicle comprising a transmission with at least two-speeds forward driving trains having respective oil pressure clutches interposed therein; a reverse driving train using one of said two oil pressure clutches used also in the forward driving trains; a selector arranged to be given changeover movements between a forward running side and a reverse running side for operating selectively either one of the forward driving trains or the reverse driving train; a manual valve interposed in an operation circuit of the transmission so that when the manual valve is in its automatic shift range on its forward running side, the selector is given a changeover movement to its forward running side and at the same time the respective oil pressure clutches in said forward driving trains are receiving pressure oil from an oil pressure source through a shift valve; the selector is given a changeover movement to



its reverse running side and said oil pressure clutch for common use is receiving pressure oil when the manual valve is in its reverse running range; said manual valve being interposed in an oil passage connecting said shift valve and said oil pressure clutch for common use being constructed such that when the same is in the automatic shift range, said oil passage is connected, but when the same is in the reverse running range, said oil passage is disconnected and at the same time a downstream passage of said oil passage connected to said oil pressure clutch for common use is in communication with the oil pressure source without oil passing through the shift valve.

4,290,326

METHOD OF MAKING A FORGED MOWING FINGER

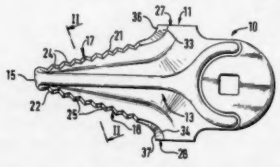
Adolf Ibach, and Heinz Könen, both of Remscheid, Fed. Rep. of Germany, assignors to Carl Sülberg, Remscheid, Fed. Rep. of Germany

Division of Ser. No. 873,244, Jan. 30, 1978, abandoned. This application Jan. 17, 1979, Ser. No. 4,312

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751523

Int. Cl.³ B21K *19/00*

U.S. Cl. 76—101 R **3 Claims**

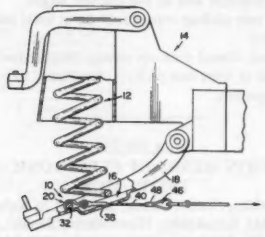


1. A method of making a mowing finger of an elongated, step-like configuration having a finger body defining a surface, a back portion formed with lateral faces that converge to a point of the finger and include with the surface angles smaller than 90° to form cutting edges with the surface, and a plurality of serrations in the cutting edge, said method comprising a single forging operation in which said body together with said back portion, lateral faces and said serrations are simultaneously finished.

4,290,327
HAND TOOL

Alton L. Riker, Rte. 1, Box 658, Riverview, Fla. 33569

Filed Nov. 19, 1979, Ser. No. 95,615
Int. Cl.³ B25B 27/00
U.S. Cl. 81—3 R 2 Claims

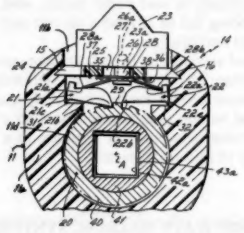


1. A hand tool for vertical alignment of a coil compression spring in automotive vehicles comprising: a coil retaining member specifically configured to engage at least one of the convoluted elements of a coil compression spring and a handle member pivotally coupled to said coil retaining member to laterally adjust the coil compression spring relative to the automotive vehicle, said coil retainer member comprises a substantially flat base having an enlarged substantially convex arcuate configuration formed at one end thereof having a substantially concave coil engaging lip extending downwardly therefrom, wherein the radius of curvature of said coil engaging lip and said enlarged substantially convex arcuate configuration are greater than the diameter of the convoluted element and the coil compression spring respectively, said coil retaining member further includes a reduced coupling element formed at the opposite end of said flat base, said reduced coupling element is offset vertically relative to said substantially flat base and in substantially the same plane as the center line of said substantially concave coil engaging lip.

4,290,328
RATCHET HANDLE

Clyde C. Clark, Davenport, Iowa, assignor to Vermont American Corp., Louisville, Ky.

Filed Feb. 15, 1980, Ser. No. 121,829
Int. Cl.³ B25B 13/46
U.S. Cl. 81—62 14 Claims



1. A ratchet tool handle of the type having a rotable ratchet gear means, pawl means for selectively and operatively engaging with and disengaging from said ratchet gear means, and control means for moving said pawl means into and out of engagement with said ratchet gear means, the improvement wherein:

said ratchet gear means includes a gear ring having teeth on an exterior side thereof,

a passageway through said gear ring,

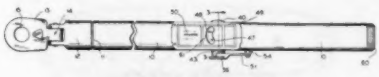
said passageway having a first cylindrical portion of predetermined diameter, and a second portion having at least one flat side, said diameter being greater than the length of said side, and

an inner sleeve disposed within the first cylindrical portion of said passageway in fixed relation with said gear ring and having a tool holding aperture therein.

4,290,329
TORQUE RELEASE WRENCH OF THE PRESET TYPE

Talmage O. Green, Schaumburg, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Oct. 9, 1979, Ser. No. 82,854
Int. Cl.³ B25B 23/142
U.S. Cl. 81—477 10 Claims

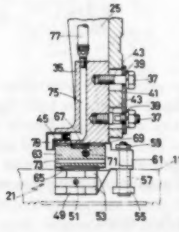


1. A preset torque wrench or the like comprising a tubular elongated handle member, a pair of superposed flex beams disposed along and within said elongated handle member, a work engaging head member anchored to the ends of said flex beams to serve as a closure for said elongated tubular handle member, means for detachably connecting said flex beams together to share the torque load and to displace said work engaging member commensurate with the flex of said beams, said detachable means being displaced a fixed distance with said flex beams until actuated by engagement with said tubular handle member to limit any further displacement thereof to effect the release of said flex beams from each other, calibrated rotary scale means journalled in said elongated tubular handle member, and a micrometer-like threaded spindle journalled in said handle member proximate to said calibrated rotary scale means, said calibrated rotary scale means being geared to said micrometer-like threaded spindle that is operatively connected to one of said flex beams to control the flexing moment arm thereof, thereby presetting the load at which said detachable beam connecting means is actuated to release said beams from connected engagement to signal and momentarily arrest any further torque load turning of said work engaging member.

4,290,330
BANDSAW BLADE GUIDING APPARATUS

Isomi Washio, Odawara, and Kenji Onishi, Isehara, both of Japan, assignors to Amada Company, Ltd., Isehara, Japan

Filed Feb. 5, 1980, Ser. No. 118,731
Claims priority, application Japan, Feb. 6, 1979, 54-13432[U]
Int. Cl.³ B27B 13/10
U.S. Cl. 83—820 2 Claims



1. A bandsaw blade guiding apparatus comprising:

a support arm forming a cavity through which the blade moves;

a guide block mounted within said cavity for pivotal movement about an axis extending transversally with respect to the direction of blade movement;

an anti-friction member fixed to the bottom surface of said guide block, said anti-friction member having a flat surface contacting the back edge of the blade during a cutting operation;

a resilient member interposed between the top surface of said guide block and the base of said cavity; and

a through passageway in said guide block between said anti-friction member and said resilient member.

4,290,331

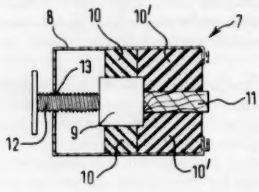
PICK-UP FOR A MUSICAL INSTRUMENT

Jerzy Izdebski, 77, Brondesbury Rd., London, N.W.6.,, England

Filed Jul. 27, 1979, Ser. No. 61,188

Int. Cl.[3] G10H *3/00*

U.S. Cl. 84—1.14 **10 Claims**



1. A pick-up adapted to be readily added-on to a musical instrument comprising a piezo-electric crystal having first and second faces, a housing surrounding said piezo-electric crystal and including top and bottom surfaces, pressure varying means extending through said top surface of said housing, said piezo-electric crystal being mounted in said housing by a resilient member, wooden coupling means for vibrationally coupling said first face of said piezo-electric crystal to a part of a musical instrument when said housing bottom surface is mounted on the musical instrument, said pressure varying means adjusting the pressure with which said piezo-electric crystal is coupled to the part, when said housing is mounted on the musical instrument, by applying an adjustable force to said second face of said piezo-electric crystal.

4,290,332

SOUND SHIELDING AND PICK-UP DEVICE

Thomas I. Schoeffling, Jr., 26 Derby Ct., Marlton, N.J. 08053

Filed Sep. 17, 1979, Ser. No. 75,900

Int. Cl.[3] G10H *3/00;* **E04B** *1/343*

U.S. Cl. 84—1.14 **11 Claims**

1. A sound shielding and pick-up device for use by placement on the side of a musician playing a musical instrument comprising:

(a) an upper front face sheet,

(b) an upper back face sheet,

(c) an upper holding means to hold the upper sheets in a parallel relationship sandwiching a sound deadening space between the sheets,

(d) a lower front face sheet,

(e) a lower back face sheet,

(f) a lower holding means to hold the lower sheets in a parallel relationship sandwiching a sound deadening space between the sheets,

(g) a hinge means between the lower edge of the upper sheet sandwich and the upper edge of the lower sheet sandwich to allow adjustment to form a concave angle between the sandwiches facing the musician,

(h) a frame means to hold the sheet sandwiches in any chosen position and at the chosen angle,

(i) at least one pickup transducer on at least one of the front faces, and

(j) electronic sound pick-up means conductively connecting each said at least one pickup transducer to sound processing equipment.

4,290,333

EXPRESSION MEANS OF ELECTRONIC MUSICAL INSTRUMENT

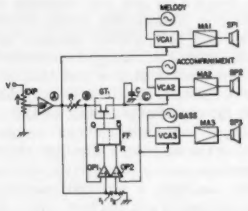
Masao Sakashita, Shobu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Feb. 11, 1980, Ser. No. 120,034

Claims priority, application Japan, Feb. 24, 1979, 54-20921; Feb. 24, 1979, 54-20922

Int. Cl.[3] G10H *1/02, 1/36*

U.S. Cl. 84—1.24 **4 Claims**



1. A circuit for an electronic musical instrument comprising:

a plurality of voltage controlled amplifiers each receiving one of a plurality of music sources for amplifying them to provide musical sound;

means for developing a first control voltage which varies in response to an operation of pedal means, said first control voltage being fed to at least a first one of said voltage controlled amplifiers;

means for developing a second control voltage which varies in response to a relatively slow operation of said pedal means and is substantially unresponsive to a relatively rapid operation of said pedal means, said second control voltage being fed to at least a second one of said voltage controlled amplifiers;

whereby said second one of said voltage controlled amplifiers is substantially incapable of accentuating its associated music source in response to a relatively quick operation of said pedal means, said first and second control voltages being substantially equal in response to a relatively slow operation of said pedal means.

4,290,334

ELECTRONIC WAVE SHARING SYNTHETIC SOUND SYSTEM

Justin Kramer, 1028 W. Eighth Pl., Los Angeles, Calif. 90017

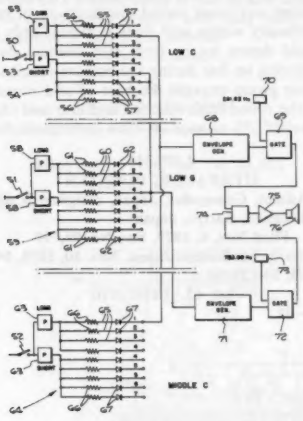
Filed Jul. 22, 1980, Ser. No. 171,106

Int. Cl.[3] G10H *1/057, 5/02*

U.S. Cl. 84—1.26 **16 Claims**

1. In a system for synthetically producing realistic musical bell sounds by electronic means including a keyboard switch member for each bell sound to be produced wherein each bell sound has a plurality of partials, pulse generators corresponding to the respective switch members, a plurality of electronic gates for the respective switch members feeding a speaker, and

an envelope generator for each partial of each said sound electrically interconnected between the pulse generator and the respective gate, the combination of a wave generator for each partial having an electric connection to the corresponding gate, and a resistor diode pair for each partial making up a plurality of groups of resistor-diode combinations for each said sound, each resistor-diode combination comprising a resistor



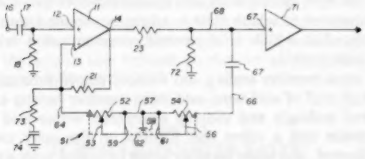
and diode in series and electrically connected between the respective pulse generator and the respective envelope generator, there being electric connections between each envelope generator and those of said individual resistor-diode combinations which serve partials of corresponding frequency, and an electric connection between each wave generator of frequency corresponding to the gate and envelope served by resistor-diode combinations for partials of corresponding frequency.

4,290,335

HIGH FREQUENCY ROLL-OFF CIRCUIT

Jack C. Sondermeyer, P.O. Box 2898, Meridian, Miss.

Filed Feb. 25, 1980, Ser. No. 124,470
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.27 **5 Claims**



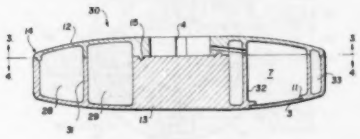
1. A high frequency roll-off circuit for a gain stage in an amplifier system, comprising, in combination, an amplifier having a feedback port, an input port and an output port, means for feeding an input signal to said input port, a feedback network connected between said output port and said feedback port, volume control means having two terminals, one of said terminals being connected to said feedback port, high frequency roll-off control means having two terminals, one of which is connected through a capacitor to said output port, the other terminals of said high frequency roll-off control means and said volume control means being connected to ground, said volume control means and said high frequency roll-off means being mechanically ganged for mutual adjustment to reduce the high frequency boost at the maximum setting of said volume control means.

4,290,336

MOLDED GUITAR STRUCTURE AND METHOD OF MAKING SAME

Hartley D. Peavey, Peavey Electronics Corp., P.O. Box 2898, Meridian, Miss. 39301

Filed Mar. 28, 1979, Ser. No. 24,529
Int. Cl.³ G10D *1/08, 3/00*
U.S. Cl. 84—291 **13 Claims**



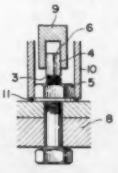
1. A guitar provided with a body, a neck connected to said body, and a fingerboard disposed upon said neck, means for fastening said neck to said body, said guitar body being formed partially solid from moldable material, in which said guitar body includes a plurality of hollow areas separated by upstanding ribs, and wherein said guitar body is formed from a top and bottom section defining a clam shell type of structure, guide means are provided between said top and bottom sections to facilitate alignment of the respective portions and at least some of said hollow areas contain foam of selected densities to control the resonance of the guitar body.

4,290,337

FASTENER SET

Takeo Kuwata, Fukumachi; Shoji Shimada, Kitakyushu, and Mikio Usa, Nakama, all of Japan, assignors to Nittetsu Bolten Kabushiki Kaisha, Yukuashi, Japan

Continuation of Ser. No. 756,344, Jan. 3, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,601
Int. Cl.³ F16B *31/02*
U.S. Cl. 411—2 **4 Claims**

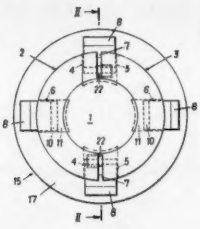


1. A fastener set comprising a bolt body having a thread and a nut threadably mounted on the bolt body, said bolt body having between the thread and adjacent end a notched portion which can be broken by a predetermined torsional force, and said nut, including its screw surfaces, being coated by a solid composition containing a partial ester obtained by only partial esterification of a polyol having not more than twelve carbon atoms and a fatty acid, wherein the reaction force resulting from a fastening torque applied to the nut which is fitted onto the threaded portion of the bolt body is transmitted to the bolt body so as to break off from the bolt body a surplus portion extending above the notched portion, so that a desired fastening axial force can be obtained by fitting the nut onto the threaded portion of the bolt body with a low rotating torque while keeping the torque coefficient at a constant.

4,290,338
STRADDLE CARTRIDGE FOR A STRADDLE CARTRIDGE ANCHOR

Rudolf Gruber, Grossdombra, Austria, assignor to GD-Anker Gebirgs-Dubel-Anker GmbH & Co. KG, Millstatt am See, Austria

Filed Jul. 17, 1979, Ser. No. 58,274
Claims priority, application Austria, Jul. 7, 1978, 4948/78
Int. Cl.³ F16B *13/10*
U.S. Cl. 411—21 **5 Claims**

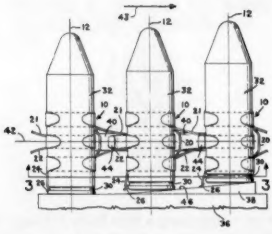


1. A rock bolt expansion anchor for anchoring a tapered head of a rock bolt in a bore, said anchor comprising a generally cylindrical expandable cartridge adapted to fit into said bore and formed with an internal taper complementary to that of said head whereby said cartridge is spread outwardly against the wall of said bore by a force applied to said bolt, and a plurality of straddle members mounted on said cartridge, each of said straddle members comprising a row of outwardly projecting fingers unitarily connected together, said straddle members being of a material having a greater flexibility than that of said cartridge.

4,290,339
CAM ACTUATED AMMUNITION PRESTRIPPING MECHANISM

Fred J. Skahill, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1979, Ser. No. 62,085
Int. Cl.³ F41D *10/06*
U.S. Cl. 89—33 CA **3 Claims**



1. Apparatus for prestripping rounds of ammunition from an ammunition belt comprising a plurality of cooperating links used in conjunction with a gas operated automatic weapon, wherein energy created by the expanding gases is used to cause an operating group to recoil from the battery position, during which recoil stroke the automatic feed mechanism of the weapon advances the ammunition belt to place the next round in position for displacement into the firing chamber by the operating group and the operating group compresses a drive spring, which expands during the counter recoil stroke and moves said operating group forward to engage the base of said round to remove the round from said link and into the firing chamber, and wherein each of said links includes a detent means for engaging an annular channel in said round for positioning and retaining said round, comprising:

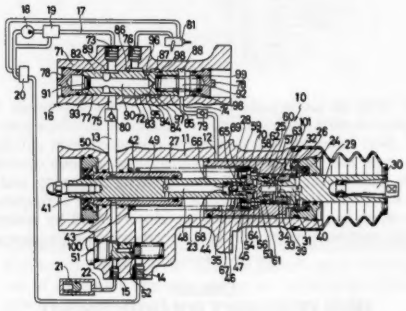
advancing means driven by the operation of said automatic weapon for advancing said ammunition belt along a transverse axis, and

cam means disposed on said weapon, said cam means having a fixed surface extending in the direction of said transverse axis and positioned such as to directly contact the base of said round and cause partial displacement of said round longitudinally within said links sufficient only to disengage said detent means from said channel during said recoil stroke, so that during the counter recoil stroke the operating group engages the base of said round and removes the round from said link and into said chamber.

4,290,340
HYDRAULIC BOOSTER

Yoshiharu Adachi, Gamagohri, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 6, 1979, Ser. No. 91,799
Claims priority, application Japan, Nov. 10, 1978, 54-139159; Nov. 10, 1978, 54-139160
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—31 **6 Claims**



1. A hydraulic booster comprising:

a housing provided with a cylindrical bore and an inlet hydraulically connected to a pump, a drain port hydraulically connected to a reservoir and said cylindrical bore;

a power piston being sealingly and slidably disposed within said bore and dividing said cylindrical bore into a working chamber to which fluid is normally supplied and a drain chamber which is in normal communication with said drain port;

an input member sealing and slidably passed through a first end wall of said bore, said input member having an inner end sealingly and slidably interposed within said power piston and a valve seat formed on the inner end face thereof, said input member being provided with a passage communicating with said working chamber and said valve seat;

an output member sealingly and slidably passed through a second end wall of said bore and connected to said power piston at an inner end portion thereof, said output member being provided therein with a passage communicating with said inlet;

a poppet valve member spaced from said input member sealing slidably disposed within said power piston and cooperable with said valve seat for controlling hydraulic communication between said working chamber and said drain chamber, said poppet valve member being provided with a passage there through and an axial projection on a back face portion thereof, said passage in said poppet valve normally being in hydraulic communication with said working chamber via said passage in said input mem-

ber, each of said passages being in substantial alignment with one another wherein said poppet valve member has a diameter approximately equal to that of said valve seat; and

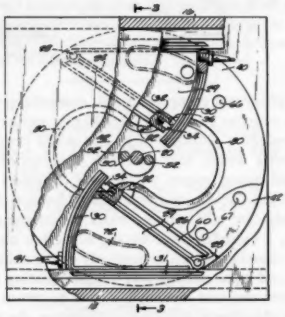
a check valve provided within said power piston for controlling hydraulic communication between said passages in said output member and said poppet valve member and opened by said axial projection of said poppet valve member when said poppet valve is slid by said input member due to engagement thereof with said valve seat upon advancement of said input member.

4,290,341

ROTARY ENGINE

Karl J. Scheibengraber, 6025 W. Spencer Pl., Milwaukee, Wis. 53218

Filed Jul. 2, 1979, Ser. No. 53,873
Int. Cl.³ F01C *9/00*
U.S. Cl. 91—339 **5 Claims**



1. An engine or pump having a frame to support a piston, output shaft, and intake and exhaust manifolds, an output shaft supported for rotation in said frame, a piston plate hingedly connected to said frame for swinging movement during the piston strokes, a working chamber associated with said piston plate, said working chamber comprising an arcuate wall having a radius concentric with the arc of movement of said piston plate, opposed parallel discs connected to said output shaft and located adjacent opposite edges of said piston plate and in planes at right angles with the pivotal axis of said piston, drive means on said piston cooperating with means on said discs to cause movement of said discs and said output shaft in response to movement of said piston plate, intake and exhaust manifolds, and ports in said discs which register with said manifolds during the intake and exhaust strokes to effect intake and discharge of working fluid.

4,290,342

HYDRAULIC BOOSTER VALVE

Larry E. Isakson, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 14, 1979, Ser. No. 103,700
Int. Cl.³ F15B *13/10*
U.S. Cl. 91—391 R **6 Claims**

1. A hydraulic booster which comprises:

a housing having an inlet and an outlet;

a hub piston reciprocable in a hub bore in the housing and having a hub piston passage which communicates with the inlet and outlet;

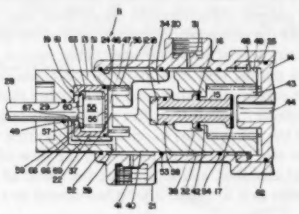
a booster piston reciprocable in a booster bore in the housing and having a booster piston chamber which is between the hub piston and the booster piston and has

a booster piston chamber outlet;

a control valve element coacting between the hub piston and the booster piston and having (i) an inlet valve to open and close an inlet between the hub piston passage and the booster piston chamber and (ii) an outlet valve to open and close the booster piston chamber outlet;

a gain valve piston reciprocable within the hub piston, the gain valve piston being located to restrict a gap in the hub piston passage to the outlet, there being a gain valve chamber in the gain valve piston and an opening in the gain valve chamber;

a push rod having one end slidably passing through a push rod opening in the hub piston and into the gain valve chamber through the opening therein;



a poppet valve disposed in the gain valve chamber on said end of the push rod to open and close the opening in the gain valve chamber;

means to bias the poppet valve in closed relation with the opening in the gain valve chamber; and

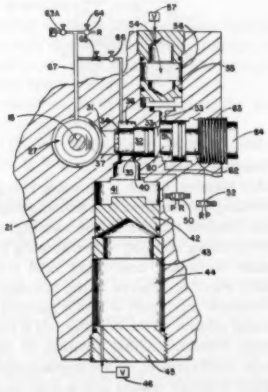
a bypass chamber in the hub piston communicating with the opening in the gain valve chamber and the hub piston passage between the outlet of the housing and the gap in the hub piston passage.

4,290,343

HIGH VOLUME POPPET VALVE WITH ORIFICE OPENING SPEED CONTROL

Martin M. Gram, Minneapolis, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Oct. 30, 1978, Ser. No. 955,964
Int. Cl.³ F15B *13/042*; F16K *31/122*
U.S. Cl. 91—461 **8 Claims**



1. In combination with a first source of fluid under pressure and a hydraulic motor, the improvement comprising a control valve having a valve body having an inlet port coupled to the first source of fluid under pressure and an outlet port coupled to the hydraulic motor, a bore in said valve body, a poppet valve member mounted in said bore, means forming a valve seat surrounding said bore, said poppet valve member having a first portion engaging said seat to seal off flow from said inlet

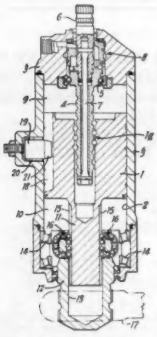
port to said outlet port when the poppet valve member is in a closed position, and said poppet valve member having a second portion of minimal cross sectional area open to the inlet port when the poppet valve is in closed position, means forming a control chamber on an opposite end of said poppet valve member from said valve seat, an accumulator providing a second fluid pressure separate from said first source of fluid under pressure to said control chamber to hold said poppet valve member against said seat, valve means having a valve opening operable to release the fluid pressure in said control chamber to permit said poppet valve member to move away from the seat, pressure at the inlet port thereafter acting to move the poppet valve member away from said seat across substantially the entire cross sectional area of the poppet valve member, said poppet valve member being moved to an open position to permit said inlet port to communicate with the outlet port across said valve seat, means other than the valve means to release forming an orifice substantially larger than the opening of the valve means to release leading from the control chamber to said accumulator to control the flow of fluid from said control chamber, and to regulate the speed of the poppet valve member as it is opened after it has moved away from said seat.

4,290,344

GEAR ASSEMBLY

Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hertfordshire, England

Filed Mar. 1, 1979, Ser. No. 16,425
Int. Cl.[3] F15B *11/08;* B62D *1/20;* F01B *3/00*
U.S. Cl. 91—467 **17 Claims**



1. A gear assembly comprising

a displaceable member which is movable along a longitudinally extending axis relative to a housing and is restrained from axial rotation relative to the housing, said displaceable member being coupled to the housing by a first coupling means to impart controlled axial rotation of the displaceable member relative to the housing,

an axially rotatable input part which is secured against axial displacement relative to the housing and is coupled to said displaceable member so that rotation of the input part effects axial displacement of the displaceable member,

a take-off part, laterally spaced and in side-by-side relationship with respect to the input part, the take-off part having an output part capable of controlled axial rotation relative to the housing,

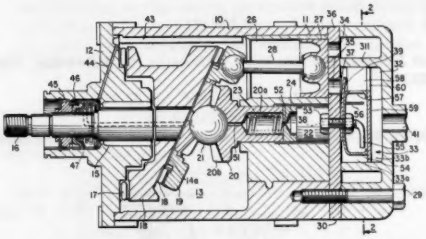
said displaceable member being coupled to the take-off part by a second coupling means, said second coupling means being adapted to cause axial rotation of the take-off part in response to controlled axial rotation of the displaceable member.

4,290,345

REFRIGERANT COMPRESSORS

Masaharu Hiraga, and Seishi Kimura, both of Isesaki, Japan, assignors to Sankyo Electric Company Limited, Isesaki, Japan

Filed Mar. 14, 1979, Ser. No. 20,436
Claims priority, application Japan, Mar. 17, 1978, 53-29873; Mar. 17, 1978, 53-29874
Int. Cl.[3] F01B *31/00;* F04B *1/18, 39/04*
U.S. Cl. 92—79 **10 Claims**



1. In a refrigerant compressor unit comprising a compressor housing, a cylinder block mounted therein and having a plurality of cylinders, a plurality of piston means respectively slidably received within said plurality of cylinders, means for driving said piston means within said cylinders to compress refrigerant gas therein, said compressor housing having a first chamber adjacent said cylinder block for containing said driving means, a cylinder head having a suction chamber and a discharge chamber which operatively communicate with said cylinders, and a gas passageway communicating between said first chamber and said suction chamber to return blow-by gas in said first chamber to said suction chamber, the improvement which comprises: partitioning means for separating said discharge chamber of said cylinder head into first, second and third chamber portions, said first chamber portion communicating with said cylinders, said second chamber portion communicating with an outlet port to be connected to an external gas-circulating system and communicating with said first portion through a first opening formed in said partitioning means therebetween, means disposed to cover said first opening of said partitioning means for separating oil from the compressed gas flowing therethrough, said third chamber portion having a second upper opening in said partitioning means and disposed below said oil separating means to cover said second opening therewith for directly receiving and accumulating oil separated by said oil separating means, and an oil passageway communicating between said third chamber portion and said first chamber for returning the separated oil to said first chamber.

4,290,346

INTRAVENOUS PUMP CHAMBER

Albert F. Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 30, 1979, Ser. No. 34,826
Int. Cl.[3] F01B *19/00;* F04B *43/00;* A61M *5/00*
U.S. Cl. 92—90 **14 Claims**

1. An intravenous pump chamber for an intravenous pump of the peristaltic type having three contact members with outer contact members programmed to constitute valve members and the central member a pumping member comprising:

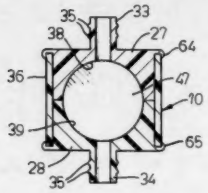
a pump chamber defined by a rigid housing member presenting a central cavity portion;

tubular portions extending from said pump chamber in a fluid communication with said cavity;

a length of intravenous tubing secured to each tubular portion, said tubing presenting a contact surface and being

capable of total collapse by one of said two outer contact members;

a diaphragm member positioned over said cavity and contacting said pump chamber adjacent said cavity portion; and



combined mechanical and sealing means operatively associated with said diaphragm member and said housing to retain said diaphragm in a taut manner over said cavity portion, said mechanical means providing an initial and subsequent stretching of said diaphragm member independently of said sealing means.

4,290,347

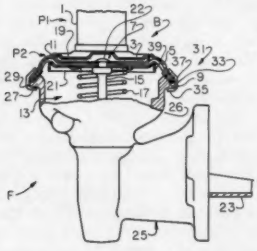
CRASHWORTHY FUEL PUMP

Walter E. Basch, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,268

Int. Cl.[3] F01B *19/02;* F04B *43/14*

U.S. Cl. 92—102 **5 Claims**



1. A crashworthy fuel pump for use in an automotive fuel system comprising:

a body having a first portion in which is formed a fuel intake cavity and a fuel discharge cavity and a second portion in which is formed a fuel pumping chamber, one end of each cavity being in fluid communication with the pumping chamber and the second portion of the body having an open end around the periphery of which is formed a lip;

a flexible diaphragm closing the pumping chamber, the diaphragm being insertable into the open end of the second portion of the body and the lip being bendable over the outer margin of the diaphragm to clamp the diaphragm within the body;

means for flexing the diaphragm to pump fuel into and out of the pumping chamber through the respective intake and discharge cavities;

a housing in which the flexing means is housed, the housing having one end formed for abutment with the open end portion of the body; and

means for clamping the body and the housing together to form a unified assembly, the clamping means comprising a ring fitted around the body and the housing to join the two together, the clamping means being sufficiently strong to hold the assembly together when the assembly is subjected to normal forces, but the clamping means breaking apart when the assembly is subjected to abnormal forces such as occur during a crash whereby the housing and the body can move apart from each other, the movement apart helping maintain the leak integrity of the diaphragm and the body, the clamping ring having at least one point of structural weakness, thus for the ring to break when subjected to abnormal forces.

4,290,348

SPRAY BOOTH

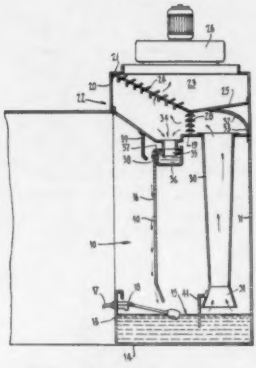
Gordon L. Morgan, and John C. Wood, both of 17 Park Rd., Cheltenham, Victoria, Australia (3192)

Filed Mar. 28, 1979, Ser. No. 24,717

Claims priority, application Australia, Mar. 29, 1978, PD3794

Int. Cl.[3] F23J *11/00*

U.S. Cl. 98—115 SB **10 Claims**



1. A water spray booth, comprising

(a) housing means including

(1) front, rear, side, top and bottom walls defining a chamber; and

(2) a generally horizontal intermediate plate (**19**) extending in spaced relation between said top and bottom walls for dividing said chamber into upper (**22**) and lower portions;

(3) said front wall containing an inlet opening communicating with said chamber lower portion, said top wall containing an outlet opening communicating with said chamber upper portion;

(b) water reservoir means arranged in the bottom of said chamber lower portion;

(c) means (**17, 18**) for supplying water to, and for maintaining water at a given level within, said water reservoir means;

(d) at least one vertical duct (**30**) arranged adjacent said rear wall for conveying water from said reservoir means to said chamber upper portion via a first opening contained in said intermediate plate, the lower portion of said duct terminating at its lower extremity adjacent said given water level, said duct having a circular transverse section, the diameter of the upper portion of said duct progressively increasing in the upward direction;

(e) a unitary deflector plate (**32**) arranged in said chamber upper portion adjacent said intermediate plate first opening, said deflector plate extending continuously transversely between said side walls and including a rear edge adjacent the junction between said intermediate plate and said rear wall, said deflector plate extending forwardly in spaced relation above said first opening:

(f) said intermediate plate containing at least one second opening (**35**) forwardly of said first opening;

(g) a horizontal water trough (**36**) arranged in said lower chamber below and in communication with said second

opening, said water trough extending transversely between said side walls;

(h) a generally vertical water wall (**16**) connected at its upper end with said water trough, said water wall extending downwardly and terminating adjacent said reservoir means for delivering a wall of water from said water trough to said reservoir means; and

(i) means (**26**) applying suction to said housing outlet opening to cause water to be drawn from said reservoir means to said water trough upwardly via said vertical duct and said first opening, forwardly via said deflector plate and chamber upper portion, and downwardly via said second intermediate plate opening, whereby excess water supplied to the trough is returned to the reservoir via said vertical wall.

4,290,349

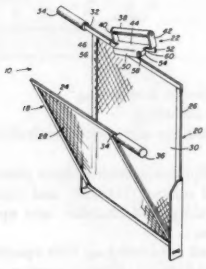
TOASTER ACCESSORY

Castenzio Fiorenza, 430 Main St., Yarmouth Port, Mass. 02675

Filed Apr. 7, 1980, Ser. No. 138,172

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—388 **8 Claims**



1. An accessory for toasting sandwiches and the like in a toaster, comprising

(a) first and second panels of generally rectangular outline and each of a generally stiff foraminous construction,

(b) yieldable and extensible hinge means connecting said panels at their lower edges to permit said panels to open and close with respect to one another and hold a sandwich or the like there-between within a range of different thicknesses,

(c) latching means movably mounted to one of said panels at the upper edge thereof and formed with a plurality of spaced locking portions adapted to lockably engage the other of said panels at selectively different positions corresponding to the thickness of the sandwich in said holder,

(d) said hinge means including a member mounted to each side of one of said panels and having a portion thereof extending perpendicularly from the plane of said one panel, each of said members being formed with a slot extending perpendicularly to the plane of said one panel, the slot in one member being in opposing registration with the slot in the other member, a pivot pin mounted to each lower corner of the other of said panels and extending from opposite sides thereof and into said slots and spring means connected between said one panel and said pins and urging said panels together.

4,290,350

MACHINES FOR PITTING AND STUFFING OLIVES

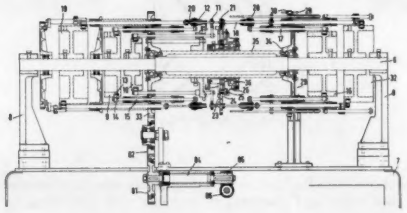
Clemente del ser Gonzalez, Talleres, 36, Villaverde Alto, Madrid 21, Spain

Filed Dec. 28, 1979, Ser. No. 108,218

Claims priority, application Spain, Nov. 8, 1978, 474,942

Int. Cl.³ A23N *4/08*

U.S. Cl. 99—494 **9 Claims**



1. An improved machine for pitting and stuffing olives comprising a fixed shaft, a drum rotatably mounted on said fixed shaft, a feed hopper for olives, means for transporting the olives from said feed hopper into tangential engagement with said drum, cam means secured to said shaft, means in operative connection with said cam means for gripping the olives on the drum, for cutting the olives, and for pitting the cut olives as said drum completes one revolution on said shaft, wherein the improvement comprises that said means for cutting the olives comprises a member for receiving the portion of the olive removed in the cutting operation, means for supplying a paste, such as an anchovy paste, into a pitted olive and for cooperation with said member receiving the cut portion of the olive for replacing the cut portion in the olive after stuffing the olive with the paste, said means for supplying paste comprises a support disc positioned on said fixed shaft adjacent the plane of movement of the olives around said drum, a cover coaxial with said support disc and joined thereto, a plate cam coaxial with and connected to said cover, a plurality of radially extending strips radially slidably supported on said plate cam, a nozzle secured to the radially outer end of each said strip so that each said nozzle can be moved radially between a first position position and a second position relative to the olives held on said drum as said plate cam rotates about said fixed shaft, means for containing a supply of the paste for stuffing the olives, transfer means for receiving the paste from said supply means and for supplying the paste into said nozzles whereby in the first position said nozzles receive pits displaced from the olives and in the second position supply the paste into the pitted olives.

4,290,351

METHOD AND APPARATUS FOR RAPIDLY SEPARATING THE ROLLS OF A CALENDER

Josef Pav, Krefeld; Franz Kayser, Geldern, and Axel Kemna, Kempen, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,632

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845055

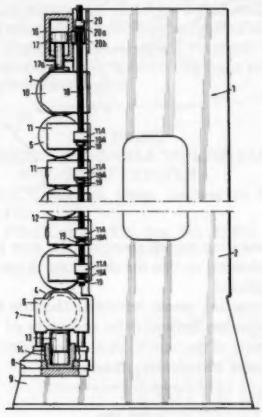
Int. Cl.³ B30B *3/04, 15/16*

U.S. Cl. 100—47 **45 Claims**

1. A method of rapidly separating the rolls of a calender wherein a row of normally closely adjacent superimposed rolls includes upper and lower outermost rolls and one of the outermost rolls is movable sideways toward and away from the other rolls to respectively reduce and increase the width of clearances between neighboring rolls and wherein the one outermost roll must move through a predetermined distance in order to allow for adequate separation of all rolls which form the row, comprising the steps of (a) moving the one outermost

roll through said predetermined distance and in a direction away from the other rolls at a series of first speeds which series includes a succession of progressively higher speeds so that the one outermost roll is accelerated during at least a portion of its movement through said predetermined distance; and (b) continuing the movement of the one outermost roll in said direction at a series of gradually decreasing second speeds and through a second distance which is at least 50 percent of said predetermined distance.

45. In a calender, the combination of a row of superimposed rolls including an upper and a lower outermost roll, one of said outermost rolls being movable toward and away from the other rolls and said rolls being adequately separable from each



other upon movement of said one outermost roll through a predetermined distance in a direction away from the other rolls; displacing means actuatable to effect the movement of said one outermost roll away from the other rolls; and control means operative to actuate said displacing means so as to effect the movement of said one outermost roll in said direction, through said predetermined distance and at a series of first speeds which series includes a succession of progressively higher speeds so that said one outermost roll is accelerated at least during a portion of its movement through said predetermined distance, and immediately thereafter through a second distance which is at least 50 percent of said predetermined distance and at a series of gradually decreasing second speeds.

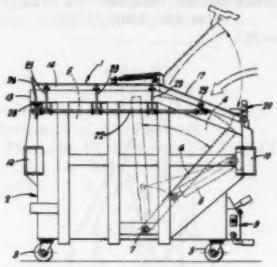
4,290,352

REFUSE BIN LID UNIT

Lewis W. Schmidt, Rio Vista; Darryl G. Bettencourt, Lodi; Charles F. Dietz, Rio Vista, and George E. Marshall, Jr., Elk Grove, all of Calif., assignors to Blackwelders, Rio Vista, Calif.

Filed May 12, 1980, Ser. No. 149,032
Int. Cl.³ B30B *1/32, 15/04*
U.S. Cl. 100—100 **2 Claims**

1. A lid unit, for a portable, invert-to-dump refuse bin, having a front, rear, and sides and defining therein a refuse-packing chamber in the rear portion and a refuse-receiving chamber in the front portion, and power means in the bin operative to thrust refuse from the receiving chamber into the packing chamber; the lid unit comprising a swing frame normally resting in substantially mating relation in closed position on the bin, a rear lid section on the swing frame overlying the refuse packing chamber, a front lid section on the swing frame overlying the refuse-receiving chamber, said lid sections normally enclosing the bin, the rear lid section being fixed on the swing frame, means transversely hinging the front lid section at the rear for swinging from a closed to an open position, means between the swing frame and the front lid section releasably latching the latter in closed position, means longitudinally hinging the swing frame at one side to the bin for swinging of



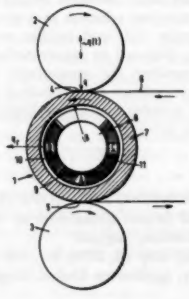
the entire lid unit from a closed position to an open position, and means between the swing frame at the other side and the bin releasably latching the entire lid unit in said closed position.

4,290,353

ROLL FOR CALENDERS OR THE LIKE

Josef Pav, Krefeld, and Josef Pav, Munich, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 97,961
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851747
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—162 B **35 Claims**



1. In a calendar or the like, a roll comprising a non-rotatable elongated carrier; a rotary cylindrical shell spacedly surrounding said carrier and consisting at least in part of magnetizable material; and means for causing said shell to float about said carrier, including at least three groups of electromagnet means mounted on said carrier within the confines of said shell and having pole faces extending along an arc of at least 200 degrees, as considered in the circumferential direction of said carrier, and means for regulating the extent of energization of each of said electromagnet means independently of other electromagnet means.

4,290,354

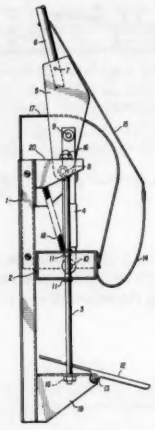
BEVERAGE CAN CRUSHER

Benjamin A. Stevens, 141 Apple Dr., Greencastle, Pa. 17225

Filed Apr. 18, 1980, Ser. No. 141,621

Int. Cl.³ B30B *15/32*

U.S. Cl. 100—218 **9 Claims**



1. A can crusher assembly comprising:

a base including a first and second shelf portion extending from said base;

at least one guide rod interconnecting said upper and lower shelf portions;

a presser member slidably mounted on said at least one guide rod for movement between a first open position for receiving an object to be crushed and a second compression position;

a pin member connected to said presser member;

a handle member;

a pivot member pivotably connecting said handle member to said first shelf portion; and

a link member pivotably interconnecting said handle member and said pin member, said link member being interconnected to said handle member in said open position above said pivot member wherein said pivot member, said at least one guide rod, said handle member and said pin member are disposed in substantially the same plane in said open position for maximizing the crushing force applied to said object to be crushed positioned between said presser member and said at least one of said first and second shelf portions.

4,290,355

TICKET PRINTING AND ADVANCING DEVICE

Henry Gross, and Samuel Gross, both of "Braewood", 45 Winnington Rd., London, England

Filed May 10, 1979, Ser. No. 37,808

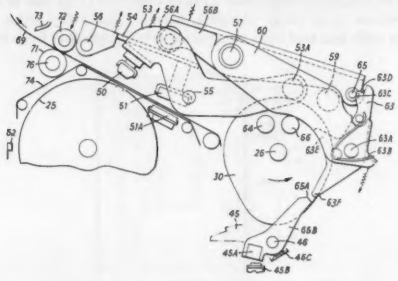
Claims priority, application United Kingdom, May 18, 1978, 20491/78

Int. Cl.³ B41J *19/76*

U.S. Cl. 101—69 **5 Claims**

1. A ticket printing and advancing device having ticket drive means, a cam, means whereby the cam can be driven through single revolutions and when required through at least three revolutions continuously, a cam follower means actuated by said cam for driving said ticket drive means, characterized by an electronically controlled stop for limiting the movement of the follower, so that the follower advances the tickets through a minor distance, stop retracting means for retracting said stop and stop restoring means to restore the stop to its follower limiting positions, said cam having a first part which includes a follower retraction part and a follower drive part means for driving the tickets through a major distance followed by a second part which includes a further follower retraction part and a further follower drive part means for driving the tickets through an intermediate distance;

said stop retracting means retracting the stop in the first of said revolutions while the cam drives the tickets through the major distance in two stages corresponding to said first and second parts of the cam;



said stop restoring means restoring the stop in the next of said revolutions, so that the tickets are driven through the minor distance;

said stop retracting means retracting the stop in the third of said revolutions between the operation of the first and second parts of the cam so that the cam drives the tickets through said intermediate distance.

4,290,356

ACTUATOR MECHANISM FOR A PRINT HAMMER OR THE LIKE

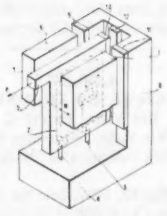
Walter H. Hehl, Steinenbronn, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1979, Ser. No. 66,156

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2837550

Int. Cl.³ B41J *9/30*

U.S. Cl. 101—93.34 **6 Claims**



1. An actuator mechanism comprising

a movable actuator element,

an actuator magnet carried by said actuator element,

said actuator magnet comprising a permanent magnet having a magnetization vector perpendicular to the direction of motion of said actuator element, and a magnet system interactive with said actuator magnet for providing a contactless magnetic holding and accelerating force for said actuator element,

said magnet system comprising

field magnet means forming an interactive field with said actuator magnet having a first magnetic field region having an unstable high potential position for producing a

magnetic accelerating force on said actuator magnet and a second magnetic field region adjacent said first magnetic field region for producing a stable magnetic field holding position of relatively high potential in the vicinity of said first field region,

said field magnet means forming said first magnetic field region comprising first stationary permanent field magnets having magnetization vectors perpendicular with said direction of motion and antiparallel with said magnetization vector of said actuator magnet, and

said field magnet means forming said second magnetic field region comprising a second stationary permanent field magnet having a magnetization vector parallel with said magnetization vector of said actuator magnet,

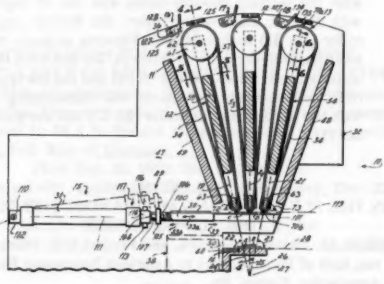
and operating means associated with said actuator element for application of a release force capable of displacing said actuator element from said stable magnetic field holding position to said unstable accelerating force position of said first magnetic field region.

4,290,357

INDEPENDENTLY OPERABLE MULTIHEAD ENDLESS BAND PRINTER

Bobby J. Clay, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 9, 1979, Ser. No. 82,981
Int. Cl.³ B41J *1/20*
U.S. Cl. 101—111 **15 Claims**



1. A marking machine comprising

a platen defining an imprint plane,

an inking pad defining a re-inking plane, said imprint plane and said re-inking plane being spaced one from the other,

at least two marking heads, each of said marking heads comprising a series of print bands adjustable to establish a desired line of information comprised of plural letters and/or numbers,

a motor for reciprocating each of said heads relative to said platen and said inking pad between a marking position, a re-inking position, and a storage position, one of said marking heads being movable in a reciprocation plane that defines a first angle relative to said imprint plane, and another of said marking heads being movable in a reciprocation plane that defines a second angle relative to said imprint plane, said first and second angles being different one from the other,

a guide for directing each of said marking heads in its reciprocation path, said guides being structured to prevent all of said marking heads' print bands from all simultaneously contacting said platen, but said guides also being structured to permit all of said marking heads' print bands to all simultaneously contact said inking pad, and

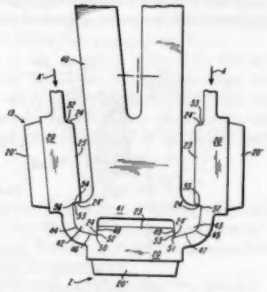
a control system connected with said motor, said control system being structured to cause one of said marking heads to move separately and independently relative to another of said heads as said heads are extended toward and retracted from said marking position, said guides and said control system cooperating to allow said marking heads to mark said information lines on a substrate positioned on said platen so that said information lines are closer together than would be possible if said marking heads were reciprocated in parallel paths.

4,290,358

PRINT HEAD

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 11, 1980, Ser. No. 111,442
Int. Cl.³ B41J *1/20*; B41K *1/10*
U.S. Cl. 101—111 **5 Claims**



1. In a print head comprising a stationary support, the support including a pair of spaced support members having respective lands and tapered entries joined to the lands, the support members having abutment shoulders joining the lands and defining a pocket for receiving a lug, a series of rotatably mounted wheels, a series of printing bands trained about the wheels and the support, means selectively engageable with any printing band for advancing the respective printing band in either direction, each printing band having a plurality of printing blocks, the printing blocks of each band having a plurality of different printing elements, hinges joining the printing blocks, a lug at the underside of each printing block, each lug having a pair of spaced end faces, the end faces being joined at their roots to the undersides of the respective printing blocks, and each lug being selectably received and detented in the pocket with its respective end faces in abutment with the abutment shoulders, the improvement in the detenting comprising that the abutment shoulders join the lands at a pair of abrupt edges, the support having an additional pair of abutment shoulders terminating at an additional pair of abrupt edges so that advance of the printing band in one direction is stopped by one abutment shoulder and one additional abutment shoulder contacting the roots of end faces of adjacent lugs or advance of the printing band in the opposite direction is stopped by the other abutment shoulder and the other additional abutment shoulder contacting the roots of end faces of adjacent lugs.

4,290,359

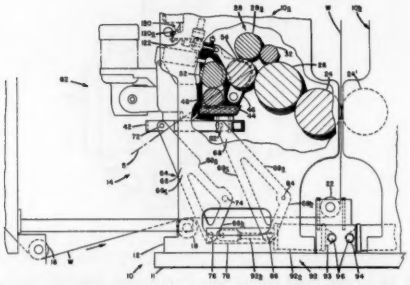
DAMPENING ASSEMBLY

Vinod Kapoor, Bayside, N.Y., assignor to Butler Greenwich Inc., Greenwich, Conn.

Filed Jan. 22, 1979, Ser. No. 5,218
Int. Cl.³ B41F *7/40*; B41L *25/16*
U.S. Cl. 101—148 **5 Claims**

1. A dampening assembly for a printing press of the type including a supporting machine frame, a plate cylinder rotatively mounted at an elevated location on the machine frame and a set of inking rollers for applying ink to the plate cylinder, said assembly comprising

(A) an assembly frame,
(B) a water tray supported horizontally on the assembly frame,
(C) a water fountain roller rotatively supported on the assembly frame so that a surface portion of said roller extends into the tray,
(D) at least one additional roller rotatively mounted to the assembly frame for conducting water from the fountain roller to the plate cylinder,
(E) motive means for rotating the rollers, and
(F) means for swingably supporting the assembly frame from the machine frame so that the assembly frame and the parts supported thereby can be swung between an elevated position wherein said at least one additional roller supported on the assembly frame contacts the plate cylinder to a lower position adjacent the floor wherein the assembly frame and the parts supported thereby are dis-



placed laterally relative to the plate cylinder so as to provide a clear access path to the plate cylinder in order to change plates quickly during a printing run, said supporting means maintaining said assembly frame and the tray supported thereby in a horizontal position as the assembly is moved between its said two positions, said supporting means including
(1) a plurality of similar generally triangular frame members, each member having
(i) a long leg pivotally connected at its opposite ends to the assembly frame and the machine frame respectively, the long legs of all of said frame members being parallel to one another, all of said members having the same distance between their said pivotal connections, and
(ii) a relatively short leg, and
(2) means for applying a force to each short frame member leg so as to cause said frame members to pivot about their pivotal connections to said machine frame.

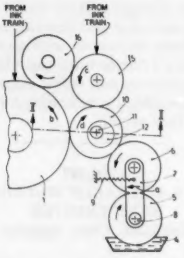
4,290,360

SELECTIVE INK AND WETTING LIQUID, OR WETTING LIQUID ONLY, APPLICATION SYSTEM FOR OFFSET PRINTING PRESSES

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft Offenbach, Augsburg, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 119,149
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 2902228
Int. Cl.³ B41F *7/26, 7/36, 7/40*
U.S. Cl. 101—148 **11 Claims**

1. In a rotary offset printing machine, apparatus to selectively in operation apply, together concurrently, or separately, printing ink and offset wetting liquid to the plate cylinder (1) thereof having
an ink train including an ink distribution roller (15, 27) having ink supplied thereto;
an ink application roller (16, 26) in ink transmitting contact with the ink distribution roller (15, 27) and the plate cylinder (1);
and an offset wetting liquid fountain system (4, 5, 6; 29, 30, 31) including a wetting liquid transfer roller (6, 31);
comprising a further application roller (10, 32) in continuous engagement with the plate cylinder which, selectively, can apply to the plate cylinder ink and wetting liquid combined, or only offset wetting liquid,
and means (12, 28) movably positioning the further application roller (10, 32), selectively, between a first operating positioning in which the further application roller is in engagement with the wetting liquid transfer roller (6, 31)



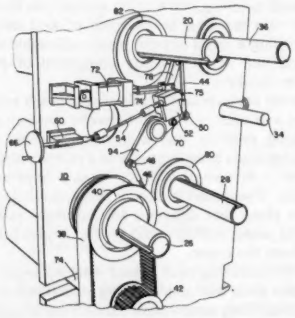
and additionally in engagement with the ink distribution roller (15, 27) and a second operating position, in which the further application roller (10, 32) is in engagement with the wetting transfer roller and out of engagement with the ink distribution roller, the further application roller (10, 32) maintaining continuous contact, in either position, with the plate cylinder (1, 25) and with the offset wetting liquid transfer roller (6, 31) and the ink application roller maintaining continuous ink transmitting contact with the ink distribution roller (15, 27) and the plate cylinder (1).

4,290,361

ON THE FLY ADJUSTING MECHANISM FOR ROTARY PRINTING PRESSES

William H. Fowler, Allentown, and Frederick L. Warner, Easton, both of Pa., assignors to American Newspaper Publishers Association, Easton, Pa.

Filed Jan. 11, 1980, Ser. No. 111,410
Int. Cl.³ B41F *5/06, 5/12*
U.S. Cl. 101—182 **3 Claims**



1. In a rotary printing press system of the type embodying a press frame supporting a first series and a second series of inking cylinder, plate cylinder and impression cylinder components, respectively mounted upon parallel shafts, on the fly adjusting mechanism interposed between the frame and the impression cylinder shafts and comprising:
A. A plurality of eccentric bushing plates supported in the

press frame so as to engage and support the ends of the impression cylinder shafts, said eccentric bushing plates enclosing corresponding eccentric seats for each of said shafts;

B. A bell crank pivotally supported upon the frame at each end of said shafts and including a first follower strut extending from one end of said bell crank to one of said impression cylinder eccentric plates and a second follower strut extending from the other end of said bell crank to the other eccentric plate, such that pivoting of said bell crank offsets said impression cylinder shafts in said first series and said second series;

C. An articulated link pivoted in said frame at one end and engaging said bell crank at its other end, said articulated link further including:

(i) a longitudinal adjustment mechanism in the form of a threaded shaft engaged by a worm drive gear mechanism, so as to vary the length of a portion of said link and thereby vary the degree of pivoting of said bell crank and said bell crank; and

D. A rotatable extension rod supported upon said frame, said rod including a clevis assembly operatively extending to said worm gear mechanism in said adjustable link such that rotations of said rod drives said worm to vary the length of said threaded shaft;

E. Piston actuating means mounted upon the press frame and engaging another portion of said articulated link, so as to pivot said bell crank, together with said eccentric bushing plates, thereby offsetting said impression cylinder shafts with respect to the respective plate cylinders.

4,290,362

INKING SYSTEM FOR A PRINTING MACHINE, PARTICULARLY OF THE OFFSET OR GRAVURE TYPE

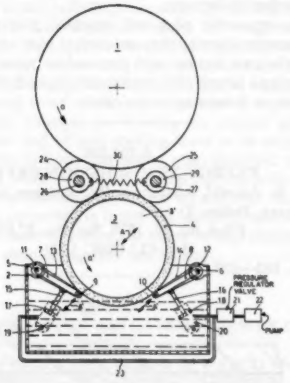
Ingo Köbler, Gessertshausen; Hans Mamberer, Königsbrunn, and Helge Zwosta, Augsburg, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,358

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856088

Int. Cl.[3] **B41F** *31/06, 31/26;* **B41L** *27/08*

U.S. Cl. 101—350 **14 Claims**



1. Inking system for a printing machine having an ink trough (2, 31, 43, 58);

an ink pick-up roller (3, 32, 44, 59) positioned above the ink trough and dipping into ink within the ink trough;

and a stripping means (9, 10, 36, 37, 52, 53, 63, 64) stripping ink off the surface of the ink roller,

wherein

and outer surface covering (4, 33, 45, 60) is provided on the ink pick-up roller consisting of foamed plastic which has discrete, unconnected pores which are open to the outer surface, said surface covering dipping from above into ink within the inktrough;

and wherein the stripping means comprises

at least one stripping roller (9, 10, 36, 37, 52, 53, 63, 64); support levers (7, 8, 34, 35, 61, 62) movably secured to the ink trough (2, 31, 43, 58) and movably supporting the at least one stripping roller in a position over the upper level of the ink;

drive means (11, 12; 65, 66) driving the at least one stripping roller at a circumferential speed which is low with respect to the circumferential speed of the foamed plastic surface covering of the ink pick-up roller;

and controllable bias force means (15–18; 38–41; 50, 51; 69–74) applying a biassing force to press the at least one stripping roller in engagement with the ink pick-up roller with controllable bias engagement force,

the position of the stripping roller over the ink trough in combination with the controllable bias force means squeezing ink from the pores of the foamed plastic covering and permitting said ink to drip into the ink trough to leave a controllable amount of ink in said pores.

4,290,363

INKING SYSTEM FOR A PRINTING MACHINE

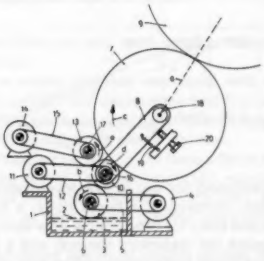
Ingo Köbler, Gessertshausen, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,270

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920152

Int. Cl.[3] **B41F** *31/06, 31/12, 31/34;* **B41L** *27/08*

U.S. Cl. 101—351 **11 Claims**



1. In a printing machine having a plate cylinder (9), an inking system having

an ink transfer cylinder (7) transferring ink to the plate cylinder and rotating with approximately the same surface speed as the plate cylinder (9);

an ink application roller (3) positioned to have ink applied thereto from an ink supply (1, 2);

two ink measuring rollers (10, 13) in surface contact with the transfer cylinder (7);

and comprising, in accordance with the invention,

adjustable bearing means (16, 17) journaling and supporting the respective measuring or metering rollers (10, 13) at a controllable distance with respect to the circumference of the ink transfer cylinder (7) to permit adjustment of the engagement gap or nip between the respective metering roller and the the surface of the ink transfer cylinder,

said ink measuring or metering rollers being positioned adjacent each other in surface ink transfer contact;

a bearing adjustment means (8, 19, 20) journaling one (10) of said rollers to controllably adjust the engagement nip between said two adjacent rollers;

said ink application roller (3) being further positioned in ink

transferring surface engagement with one (**10**) of said measuring rollers;

means (**6**) controllably adjusting the engagement nip between the ink application roller (**3**) and the associated ink measuring or metering roller (**10**);

an individual drive system (**11**, **12**; **14**, **15**) associated and in driving connection with the respective ink measuring or metering rollers.

the drive system (**11**, **12**) which drives the measuring or metering roller (**10**) in engagement with the ink application roller (**3**) driving said engaged measuring or metering roller (**10**) in a direction counter the direction of rotation of the ink transfer cylinder (**7**) and at a controllable adjustable surface speed;

the drive system (**14**, **15**) which drives the contacting measuring roller (**13**) driving said contacting measuring roller (**13**) in the same direction of rotation as the ink transfer cylinder (**7**) and a surface speed higher than that of the ink transfer cylinder; and

the measuring roller (**13**) being driven at said higher speed being positioned—with respect to the direction of rotation of the ink transfer cylinder (**7**)—behind the roller being driven in the opposite direction of rotation.

4,290,364

GUIDED BOMB FOR USE IN LOW LEVEL FLYING

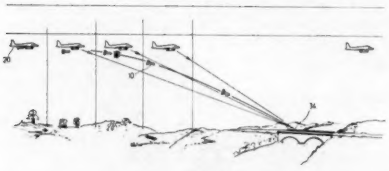
Dieter Weidenhagen, Neubiberg, and Werner Schnaebele, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm G.m.b.H., Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,213

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2803036

Int. Cl.[3] **F42B** *25/24*

U.S. Cl. 102—384 **2 Claims**



1. A guided bomb for use in low level flying for pinpoint target combat, comprising, a bomb body, a braking device mounted on said body for producing a slow-down of said body effective against the trajectory thereof, and a picture-taking sensor on said bomb body connected to said bomb body and controlling the flight thereof for final phase guidance, and a mechanical connection for connecting said bomb to an aircraft and connected to said picture-taking sensor.

4,290,365

SHOTSHELLS

Andre T. Dreyer, P.O. Box 165, Clocolan, South Africa (9735)

Filed Jan. 29, 1979, Ser. No. 7,250

Claims priority, application South Africa, Feb. 3, 1978, 78/0670

Int. Cl.[3] **F42B** *7/00*

U.S. Cl. 102—449 **11 Claims**

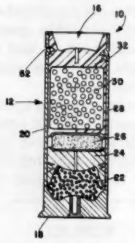
1. A shot-shell comprising a cartridge case having a base containing an opening for receiving a primer and a metal sidewall extending away from the base and defining an open end of the case at the opposite end to the base, said sidewall having a thickness of not less than about 0.5 mm over at least substantially the whole of its length; a charge comprising propellant and gunshot contained in the cartridge case; and an upper plug closing off the open end of the case; and a lower plug interposed between the propellant and the gunshot, the lower plug being of substantially identical construction to the plug closing the cartridge case; said plugs each being at least a friction fit within the cartridge case and each being cup-shaped to reduce its weight and material content, said plugs each having a length of at least about one-half its diameter and frictionally engaging said sidewall at locations along its length to prevent it from twisting in the case about an axis perpendicular to the sidewall of the case, said upper plug retaining at least the gunshot in said cartridge case.

11. A shotshell comprising:

a cartridge case having a base containing an opening for receiving a primer and a metal sidewall extending away from the base and defining an open end of the case at the opposite end to the base, the sidewall having a thickness of not less than about 0.5 mm over at least substantially the whole of its length and having an essentially groove-free inner wall;

a primer in the opening in said base;

a propellant in said case adjacent to the primer to be ignited by the primer;



a cup-shaped overpowder plug pressed down into the case to trap the propellant adjacent to the primer;

a shot cage received in the case on the opposite side of the overpowder plug to the propellant and defining a shot receiving space facing away from the overpowder plug;

shot received in the cage to be propelled from the cage by the propellant; and

an overshot plug of substantially identical construction to said overpowder plug pressed into and closing off the open end of the case, said overshot plug trapping at least the shot in the case;

said overpowder plug and overshot plug each having a diameter whereby they are each at least a press friction fit in the case against said groove-free inner wall and each having a length of at least about one-half of its diameter to prevent it twisting in the case.

4,290,366

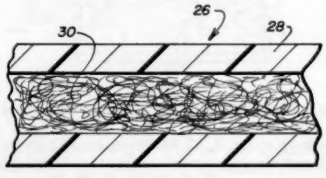
ENERGY TRANSMISSION DEVICE

Florian B. Janoski, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Jul. 16, 1979, Ser. No. 57,898

Int. Cl.[3] **C06C** *5/00*

U.S. Cl. 102—202.3 **30 Claims**



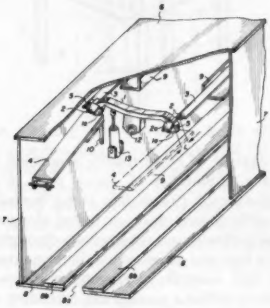
1. An energy transmission device for transmitting an explosive signal from an initiator to a receptor comprising:

(a) an elongated tube; and
(b) a self-oxidizing material loosely contained within said tube an extending substantially along the length of said tube for propagating an explosive signal through said tube.

4,290,367
OVERHEAD CONVEYOR

Joachim Brause, Krefeld; Thomas Gerhard, Viersen; Manfred Keller, Duisburg, and Henry Olszok, Krefeld, all of Fed. Rep. of Germany, assignors to Waggonfabrik Uerdingen A.G., Krefeld, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,077
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819068
Int. Cl.³ B61B *3/00*
U.S. Cl. 104—105 **7 Claims**



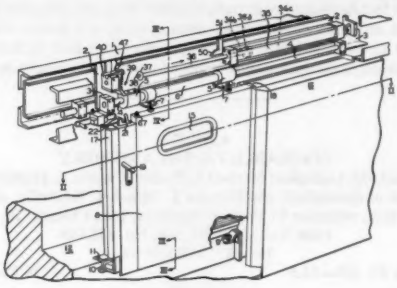
1. In an overhead conveyor including a track installation having at least one track switch point, a trolley carriage suspended on said installation and supporting a rocking lever, guiding rails and locking rails secured to said installation in the range of said switch point and at least two guiding rollers supported respectively on the ends of said rocking lever on said carriage to engage selected guiding rails in the range of said switch point, a combination comprising safety means for enhancing the switching operation in the range of said switch point, said safety means including an upwardly inclined tongue provided on said track installation before the range of said switch point below the path of movement of a guiding roller at one end of said lever; a slide shoe attached to said one end of the rocking lever to engage the sloping surface of said tongue to tilt said rocking lever about a predetermined angle; said locking rail being arranged for locking the second guiding roller at the other end of said rocking lever in its angularly displaced position; at least one safety nose attached to said other end of said lever above said second guiding roller, said nose being inclined downwardly in the direction of travel of said carriage and exceeding in length the radius of said second guiding roller to enter the effective range of said locking rail before said slide shoe disengages said tongue.

4,290,368
MANUAL AND MOTOR ACTUATED RAILWAY CAR DOOR

Giulio Mazzini, Florence, Italy, assignor to WABCO Westinghouse, Turin, Italy

Filed Mar. 16, 1978, Ser. No. 887,167
Claims priority, application Italy, Mar. 21, 1977, 67617 A/77
Int. Cl.³ B60J *5/06*; B61D *19/00*; E05B *65/20*
U.S. Cl. 105—341 **6 Claims**

1. A sliding door for railroad cars comprising:
(a) a horizontal support member fixed on the car and on which the door is reciprocably slidably operable between open and closed positions;
(b) a pneumatically operable cylinder device including a piston reciprocably operable therein and separating front and rear pressure chambers in the cylinder device;
(c) a piston rod connected to said piston and having a free end extending exteriorly of the cylinder device, said cylinder device being arranged on said support member longitudinally parallel to the direction of travel of the door;
(d) a catch device carried by the door and including a first catch element so positioned as to be engageable by a second catch element carried by the free end of the rod, said catch elements cooperating with each other for effecting power operation of the door by the cylinder device during closing and emergency opening of the door;
(e) an electropneumatic control circuit operable, when energized, for effecting pressurization of the rear pressure chamber of the cylinder device and consequently extension of the piston rod from a retracted position in the cylinder devices to an extended position thereoutof in which said first and second catch elements abuttingly engage, upon a predetermined distance of travel of the rod out of the cylinder device, to effect consequent operation



of the door from its said open position toward its said closed position;
(f) first release means operably associated with said catch device and operable for disengaging said first and second catch elements when the door has reached a certain predetermined distance from its closed position;
(g) a lock mechanism carried by the door adjacent the upper leading edge thereof and automatically operable, upon attainment of the closing position of the door, for locking said door in its said closed position until manually released; and
(h) a normally closed electrical switch carried on the door operably connected to said lock mechanism and operable in the closed position of the door to an open position in which the electropneumatic control circuit is deenergized, said control circuit being effective, when deenergized, for venting said rear pressure chamber to atmosphere and pressurizing the front chamber for causing operation of the cylinder device and consequent retraction of the piston rod.

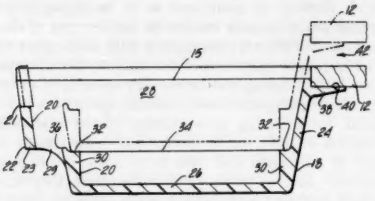
4,290,369
STACKING PALLET

Robert L. Propst, Bellvue, Wash., and William B. Raftery, Grandville, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Oct. 3, 1979, Ser. No. 81,536
Int. Cl.³ B65D *19/26, 19/40*
U.S. Cl. 108—53.3 **3 Claims**

1. A pallet comprising a generally horizontal body having an outer edge and capable of carrying a load, means forming a plurality of body openings at predetermined locations in said body outer edge, and a plurality of substantially identical feet positioned in said body openings and secured to said body, each of said feet being provided with an open upper end,

downwardly tapered side portions, and a generally horizontal bottom portion, means forming an internal support flange spaced above said bottom portion so that one of said feet is operable to telescope downwardly into another of said feet to a supported position wherein said bottom portion rests on the internal support flange therein, whereby an upper pallet can



have its feet telescoped into and supported in the feet of a lower pallet with the pallet bodies being spaced apart vertically, and an opening formed by one side portion of each of said feet having a lower portion offset from and discontinuous with an upper portion, said opening forming a handle above said opening adjacent said body outer edge and facilitating location of the pallet with respect to parts and equipment.

4,290,370

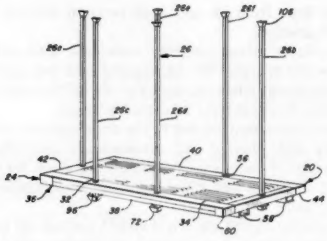
STACKABLE PALLET ASSEMBLY

Ronald M. Gallagher; Michael E. Nadler; Charles E. Highsmith, all of Springfield, and Richard L. Minchey, Nashville, all of Tenn., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Nov. 21, 1977, Ser. No. 853,418

Int. Cl.³ B65D *19/28*

U.S. Cl. 108—53.5 **18 Claims**



1. A stackable pallet assembly, comprising:

a plurality of posts;

a pallet having an upper load-supporting surface;

post-supporting means carried by said pallet for rigidly supporting each of said posts;

post removal means operatively associated with said post-supporting means for facilitating removal of said posts from said post-supporting means; and

at least one bracket assembly connected to one of said posts, said bracket assembly including a bracket support connected to said post, an intermediate supporting arm for extending outwardly of said bracket support, connecting means attached to one end of said intermediate support arm for removably connecting said intermediate support arm to said bracket support, a transverse bar attached to the other end of said intermediate support arm, a first load-carrying arm extending inwardly from said transverse bar on one side of said intermediate support arm and a second load-carrying arm extending inwardly from said transverse bar on the other side of said intermediate support arm.

4,290,371

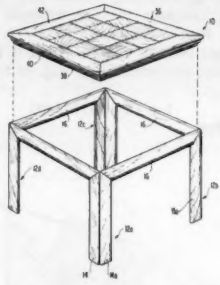
TABLE AND METHOD OF ASSEMBLY

Morton Snitzer, and Gary L. Fehrenbacher, both of Evansville, Ind., assignors to Indiana Wood Specialty, Inc., Evansville, Ind.

Filed Sep. 5, 1979, Ser. No. 72,615

Int. Cl.³ A47B *3/06;* **F16B** *7/00*

U.S. Cl. 108—159 **9 Claims**



1. A table capable of being readily assembled or disassembled comprising, a plurality of spaced pairs of legs, means releasably joining each pair of legs along mutually engaging longitudinal surfaces, said means including elongated channels extending longitudinally and substantially throughout each leg of each pair of legs and opening in a direction transversely of the legs into said mutually engageable surfaces at opposed throat portions to define a passageway extending substantially throughout each pair of legs, said channels and the passages formed thereby extending and opening into the bottom surfaces of the legs respectively, each channel having a base dimension greater in width than the throat thereof, a plurality of elongated locking strips respectively located in the channels of each pair of legs and extending substantially throughout the length of the channels to connect the pair of legs together, said locking strips having a base portion spanning the channels and a plurality of resilient deformable tabs overlying the base portion and respectively received in the channels to prevent transverse separation of the legs of each pair, said channels each including a first side extending at an angle to the base thereof and engaging one of the tabs of the associated locking strips, and a second side opposite the first side engaging a portion of the base portion of the associated locking strip, the tabs being attached to the opposite sides of the base portion of the locking strip and extending inwardly at an angle towards the plane of the associated base portion of the strip and terminating in free edges spaced from each other, and wherein the table further includes generally horizontal strut members respectively connecting each adjacent pair of legs to hold the pairs of legs in a predetermined spaced relationship defining a space of predetermined configuration, and a table top supported over and by said legs and struts and having means preventing relative movement between said pairs of legs.

4,290,372

FURNACE DOOR HAVING SEALING STRUCTURE FOR SEALING BETWEEN FURNACE DOOR AND FURNACE FRAME

Shitomi Sato, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Aug. 17, 1979, Ser. No. 67,644

Claims priority, application Japan, Aug. 21, 1978, 53/101983; Aug. 21, 1978, 53/114917[U]; Sep. 18, 1978, 53/114965; Jan. 30, 1979, 54/11725[U]

Int. Cl.³ F23M *7/00*

U.S. Cl. 110—173 R **23 Claims**

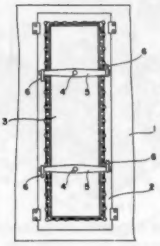
1. A furnace door having a sealing structure for sealing space

between the furnace door and a furnace frame, said sealing structure comprising,

pressing means attached to said furnace door movably toward and away from said furnace frame,

sealing means disposed between said pressing means and said furnace door and adapted to move with movement of said pressing means and to abut against said furnace frame,

characterized in that said sealing means (**11**) on at least two opposite sides (**3***a*, **3***a*) of said furnace door (**3**) respectively



comprise a spring leaf (**12**) and a knife edge (**13**, **13***b*) attached to a free side of said spring leaf (**12**),

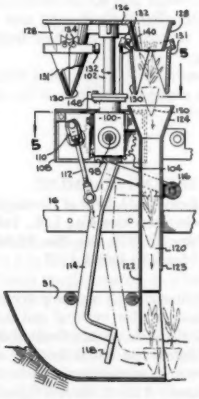
and a slip plate (**8**) provided between said furnace door (**3**) and said spring leaf (**12**) and between said pressing means (**22***a*, **22***b*) and said furnace frame, said slip plate (**8**) being adapted to slide with a movement of said pressing means (**22***a*, **22***b*) toward said furnace frame (**2**) to thereby cause said knife edge (**13**, **13***b*) by way of said spring leaf (**12**) to abut against said furnace frame (**2**).

4,290,373

SEEDLING TRANPLANTER

W. Stewart Boots, Belle Glade, and Jay C. Altman, Clewiston, both of Fla., assignors to Mechanical Transplanter Company, Holland, Mich.

Filed Dec. 21, 1979, Ser. No. 105,869
Int. Cl.[3] **A01C** *11/00*
U.S. Cl. 111—3 **10 Claims**



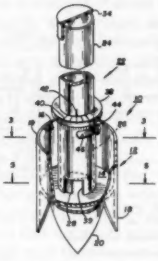
1. A seedling transplanter comprising a main longitudinally extending frame, hitch means at a front end of said main longtidunally extending frame for attachment to a tow vehicle, a pair of oppositely canted wheels rotatably fixed to a rear end portion of said frame, hollow plow means depending downwardly from said frame and having a rearwardly open internal chamber for forming a furrow in the soil as said frame is moved by the two vehicle, rotatable turret means including a plurality of selectively openable cups spaced equidistantly about said turret and each of which is adapted to receive a manually inserted seedling in a generally upright position, a fixed discharge tube fixedly positioned with respect to said frame and extending from a position beneath said turret into said internal chamber in said plow means, drive means for said rotatable turret to sequentially align each of said cups with said fixed discharge tube, said cups each including facing cup-halves defining the bottom of each of said cups, and cam means to sequentially simultaneously open both of said cup-halves of each of said cups is aligned with said discharge tube to drop a seedling disposed therein into said discharge tube for movement through said tube into said chamber of said plow and oscillating kicker means having a lower end positioned for movement in said chamber for engaging each seedling in the chamber for moving each seedling rearwardly from said chamber into the furrow, said oppositely canted wheels being disposed to close the furrow over the root clump of the seedlings.

4,290,374

HAND-HELD AND OPERATED SEEDER APPARATUS

Billy G. Maples, 65 Dale Rd., Middletown, N.J. 07748

Filed Jul. 12, 1979, Ser. No. 56,988
Int. Cl.[3] **A01C** *5/02, 7/02, 15/02*
U.S. Cl. 111—92 **6 Claims**



1. A hand held and operated seeder apparatus particularly adapted for local application of seed and the like to selected lawn areas, said seeder apparatus including:

(a) an elongated rigid tubular handle, having a predetermined diameter and providing a seed storage means, said rigid tubular handle having an upper end and a lower end, the upper end of the rigid handle adapted for grasping in and by a hand of a user for manipulation thereof, at said lower end of the rigid handle and carried thereby is a seed applicator;

(b) said seed applicator having a circular cup member with an open top, imperforate sidewalls secured to a substantially flat base portion, said substantially flat base portion larger than said predetermined diameter of said rigid handle and with said imperforate sidewalls secured to said substantially flat base portion so as to extend upwardly and downwardly from said substantially flat base portion, said imperforate sidewalls of said circular cup member in said secured condition being substantially coaxially aligned with the axis of said rigid tubular handle, said downwardly extending sidewall of said circular cup member having a plurality of tooth-like projections adapted to enter and cultivate the ground when and while the seeder apparatus is manipulated toward and into the ground, and

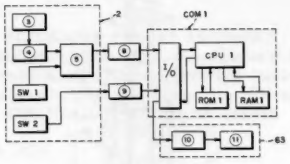
(c) a seed escapement means formed in said lower end of the rigid handle and adapted to deliver to the inside of said circular cup member and be retained by said imperforate sidewalls thereof seeds in and from said rigid tubular handle, said seed escapement means including a castellated end formation in and at said lower end of the rigid tubular handle, with a rotatable sleeve carried by said

lower end of the rigid tubular handle so that as said rotatable sleeve is selectively positioned the seed from said rigid tubular handle escapes into said circular cup member in a metered amount corresponding to the desired quantity of seed to be distributed and when the seeder apparatus is moved up and down seed in said rigid tubular handle flows through said seed escapement means and into said circular cup member from which the seed is jostled to and over said open top of the imperforate sidewall of the circular cup member so as to fall onto and into localized areas of the ground.

4,290,375
APPARATUS FOR WRITING AND USING EMBROIDERY INFORMATION ON MAGNETIC TAPE

Yoshinobu Tonomura, Hachioji; Toshio Fujimura, Musashino; Masanori Hara, and Hideaki Takenoya, both of Hachioji, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,321
Claims priority, application Japan, Sep. 22, 1978, 53-115896; Sep. 22, 1978, 53-115897
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **4 Claims**



3 · High frequency generator
4 · Stylus pen
5 · Coordinate analysis panel
8 · Coordinate signal
9 · Control signal
10 · Modulation circuit
11 · Magnetic tape

1. An apparatus for providing embroidery information and control signals to a recorder in order to record such information and signals on a magnetic medium in a manner that the medium can be used to operate an automatic embroidery machine which includes a fixed sewing machine, a movable embroidery frame, and a temporary memory of a predetermined capacity, comprising:

an embroidery analysis panel;

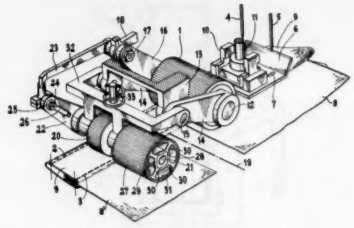
a stylus pen having a coordinate switch and a control switch, the coordinate switch causing coordinates of a point on the embroidery analysis panel to be registered when the stylus pen is located at the point and the coordinate switch is operated by a user and the control switch generating a control signal when the control switch is operated by a user to indicate a last point on a continuous part of an embroidery pattern, the control signal being in a form which will cause the automatic embroidery machine to stop embroidering after said last point has been sewn prior to embroidering another continuous part of an embroidery pattern; and

a microcomputer cooperating with the embroidery analysis panel, the stylus pen, the coordinate switch and the control switch and connectable to the recorder, the microcomputer classifying points so registered into at least one continuous part of an embroidery pattern and converting all points so registered into embroidery information suitable for use in an automatic embroidering machine.

4,290,376
AUXILIARY TRANSPORT DEVICE FOR SEWING MACHINES

Gianfranco Brusasca, Cornaredo, and Gianfranco Garzulano, Galliate, both of Italy, assignors to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Nov. 5, 1979, Ser. No. 91,632
Claims priority, application Italy, Dec. 13, 1978, 30772 A/78
Int. Cl.³ D05B *21/00, 27/14, 27/06*
U.S. Cl. 112—121.26 **5 Claims**



1. An improved auxiliary transport device for sewing machines of the type having a pair of spaced needles with a cooperating presser foot forming a sewing zone for attaching bands to partially sewn workpieces, said transport device comprising:

(a) a support bracket **(13)** mounted on the sewing machine rearwardly of and in alignment with the needles and presser foot;

(b) an auxiliary transport means defining a first roller **(1)** extending perpendicular to the direction of sewing and pivotably attached to said support bracket **(13)** including;

(i) drive means for effecting incremental rotation thereof for assisting in the advance of the workpiece from the sewing zone;

(c) a stretching means for engaging the bands attached to the workpiece defining a second roller **(20)** spaced from and operatively connected to said first roller **(1)** for effecting simultaneous incremental rotation therewith;

(d) a compensating transport means defining a third roller **(27)** mounted co-axial and for incremental rotation with said second roller **(20)** for engaging and advancing that portion of the workpiece extending from the attached band, including;

(i) yielding means for effecting limited vertical movement thereof when engaging portions of the workpiece varying in thickness.

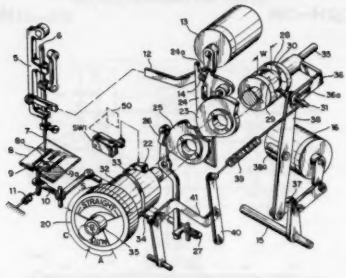
4,290,377
SEWING MACHINE

Susumu Hanyu, and Kenji Kato, both of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,946
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **4 Claims**

1. In a sewing machine having a rotary drive shaft, a needle bar with a needle mounted for vertical and lateral reciprocation to penetrate a fabric to be sewn, a feeding device including a feed adjuster to control the fabric feeding amount and the direction of fabric feeding, an electronic control device electrically operated to generate a stitch control signal per rotation of the rotary shaft of the sewing machine for controlling the needle position and the fabric feeding position, and electric means activated by the stitch control signal for actually controlling the needle position and the fabric feeding position to automatically produce various stitch patterns, the combination comprising means manually operated to a first range to render the electronic control device operative and to a second range to render the electronic control device inoperative; and switch means adapted to be closed for rendering the electronic con-

trol device operative or opened for rendering the electronic control device inoperative, said manually operated means including first cam means to open said switch means, second cam means operatively connected to the feed adjuster and



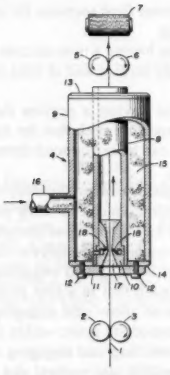
being operative for adjusting the latter for feeding the fabric in a forward direction, the third cam means operatively connected to the needle bar and being operative for displacing the needle to a predetermined position and maintaining the needle in said predetermined position.

4,290,378

TWISTED SINGLES CARPET YARN

Arnold E. Wilkie, Pensacola Beach, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 31, 1979, Ser. No. 71,460
Int. Cl.³ D02J *1/08*
U.S. Cl. 112—410 **23 Claims**



1. A bulky, heatset singles carpet yarn, said yarn having a bundle twist of 0.5 to 6.0 turns per inch (19.7 to 236.2 turns per meter) and sufficient tangle to provide a lateral coherency of 1 to 15 cm, wherein said tangle is imparted to the yarn after said bundle twist.

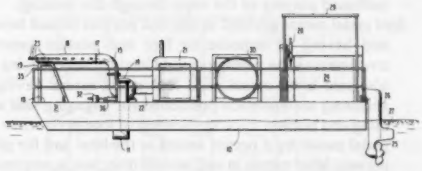
13. A process for heatsetting a bulked, twisted singles yarn having a bundle twist between 0.5 and 6.0 turns per inch (19.7 to 236.2 turns per meter), comprising: passing said singles yarn at an overfeed of from 10 to 50% through an open-ended tubular chamber filled with a heat fluid, wherein at least one jet of heated fluid is directed laterally against the yarn at a velocity sufficient to cause filaments or fibers at the outside of the bundle to entangle with those at the inside of the bundle along the entire length of the yarn, said process being characterized in that the temperature of the heated fluid and the residence time of the yarn in the chamber are correlated to set the twist in the yarn and the overfeed and velocity of said heated fluid are correlated to provide a yarn having a lateral coherency of 1 to 15 cm while imparting a slight tension to the yarn sufficient to facilitate handling of the yarn.

4,290,379

SUPPRESSION OF SURFACE FOAM ON DETERGENT-CONTAMINATED LAGOONS

Festus A. Carter, Rte. 1, Highway 341 North, Odum, Ga. 31555

Filed Jul. 30, 1979, Ser. No. 61,916
Int. Cl.³ C02C *1/08*; A62C *27/00*
U.S. Cl. 114—26 **4 Claims**



1. A machine for suppressing foam on the surface of a detergent-contaminated body of water, comprised of

a powered barge;

a horizontally disposed, C-shaped pipe having an internal diameter of about 8 to 12 inches mounted on the barge above the gunnels at a height of about 5 to 7 feet above the waterline, the length, configuration, and placement of the pipe being such that the pipe generally encircles the bow and extends part way along each side of the barge, said pipe having no outlet except for a series of horizontally directed sections of straight pipe about 8 to 10 inches long, having an internal diameter of about ¾ to 1⅛ inches, projecting therefrom along substantially the entire length of the pipe; and

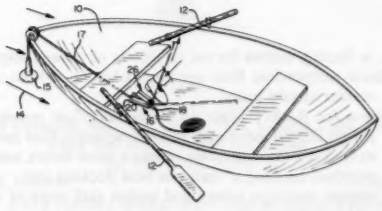
pump means carried by the barge for removing subsurface water from the body of water on which the barge is floating and delivering that sub-surface water to the pipe under sufficient pressure that the water is forced out of all of the sections of straight pipe simultaneously and is propelled a distance of about 30 to 45 feet, at its furthest search, from the topside of the barge.

4,290,380

FOOT CONTROLLABLE BOAT ANCHOR ROPE LOCKING DEVICE

Laurance R. Bolen, 3205 S. Davidson, Albany, Oreg. 97321

Filed Nov. 23, 1979, Ser. No. 97,053
Int. Cl.³ B63B *21/22*
U.S. Cl. 114—210 **16 Claims**



1. A foot controllable boat anchor rope locking apparatus comprising:

a housing which defines a passageway through which the anchor rope may be threaded with the outboard end of the rope being connected to the anchor, said housing being adapted for mounting to the boat below the level of seats in the boat to thereby make the housing readily accessible to the foot of a person seated in the boat;

lever means pivoted to said housing for pivoting about a lever means pivot axis, said lever means having a snubbing end portion positioned within said passageway, and an actuating end portion said lever means being positioned such that pivoting said lever means in a first direction about said lever means pivot axis causes said snubbing end portion to close said passageway sufficiently to prevent the rope from playing outboard through the housing, and such that pivoting said lever means in a second direction about said lever means pivot axis causes said snubbing end portion to open said passageway sufficiently to permit outboard playing of the rope through the housing;

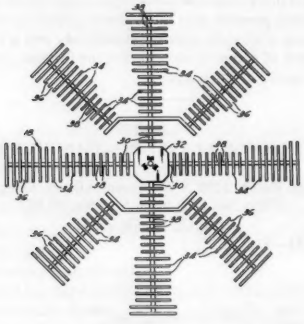
foot pedal means pivoted at one end portion to said housing and having its opposite or free end portion generally overhanging the passageway defined by said housing and also said lever means, said foot pedal means having an actuating undersurface positioned for engaging said actuating end portion upon application of foot pressure to said pedal means by a person seated in the boat and for pivoting said lever means in said second direction in response to the foot pressure.

4,290,381

FLOATING MARINA

Dexter D. Penman, 9091 Orangewood Ave., Garden Grove, Calif. 92641

Filed Dec. 19, 1978, Ser. No. 970,928
Int. Cl.[3] E02D *29/00*
U.S. Cl. 114—263 **21 Claims**



1. A floating marina for use on a body of water comprising:

plural independent float members adapted to float on the surface of said water;

means for flexibly interconnecting said float members to permit limited movement between adjacent float members to facilitate the absorption of minor wave forces, said float members forming at least one boat docking slip;

a support structure submerged within said body of water, said support structure possessing structural integrity sufficient to maintain the position and orientation of said structure relative to said body of water; and

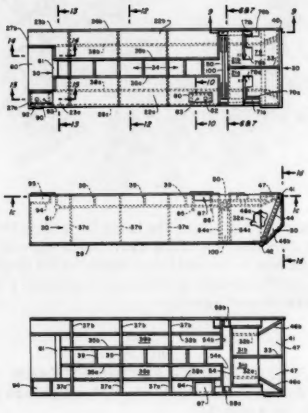
means connected between said float members and said support structure for suspending said support structure beneath said float members at a predetermined depth, above the bottom of said body of water, said suspending means further serving to define the positions of said float members.

4,290,382

CONNECTOR RECEIVER FOR PONTOON CAUSEWAYS

Hugo Conti, 3639 Ocean Dr., and Joseph A. Drelicharz, 1300 Elder, both of Oxnard, Calif. 93030

Filed Oct. 16, 1978, Ser. No. 952,021
Int. Cl.[3] B63B *35/38*
U.S. Cl. 114—266 **10 Claims**



1. Apparatus in buoyant float sections, for engaging a plurality thereof, comprising:

a. a connector means having a nose section with a longitudinally inclined front surface and at least two vertical locking grooves;

b. a pontoon section having a portion defining a channel with at least one aperture such that the nose section of said connector means can be introduced through said aperture into said channel;

c. at least one engaging member slideably disposed within a vertical slot in communication with said channel; said engaging member having portions thereof slideable within the locking grooves in said connector means;

d. locking means for holding said engaging member within said vertical slot such that in a first position said locking means is operable to allow said engaging member to extend to some intermediate point within said channel; said locking means permitting said engaging member to freely move vertically within said vertical slot above said intermediate point, said locking means in an open position operable to allow said engaging member to extend below said intermediate point within said channel;

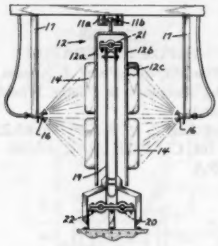
e. said connector means being extended into said channel such that the longitudinally inclined front surface of the connector means nose contacts said engaging member, causing the engaging member to slide upward within said vertical slot until said engaging member and the connector means nose locking grooves are aligned, at which time with said locking means in open position said engaging member is operable to slide by gravity into said locking grooves thereby engaging said connector within the channel of said receiver assembly;

f. said locking means also being operable to be placed in a closed position to hold said engaging member down in said vertical slot for preventing accidental disengagement of said engaging member with said connector means locking grooves.

4,290,383
SPRAYING ARRANGEMENT

Thomas E. Pfender, Vanderburgh County, Ind., assignor to Creative Craftsmen, Inc., Evansville, Ind.

Filed Jul. 31, 1979, Ser. No. 62,337
Int. Cl.[3] B05C 5/00, 15/00
U.S. Cl. 118—630 6 Claims

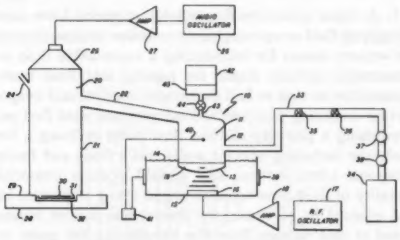


1. In combination with a conveyor installation including structure supporting a single line of hangers adapted to receive articles for spray processing, a spraying arrangement comprising sprayer equipment disposed on opposite sides of said single line of hangers and facing in the direction of articles carried therebetween, said articles carried on said hangers being in oppositely facing directions and separated by an upstanding overspray collecting shield which permits the simultaneous spraying of articles on both sides of said overspray collecting shield and multiple spray processing capacity for said single hanger line.

4,290,384
COATING APPARATUS

Christopher P. Ausschnitt, Southport, and David A. Huchital, Fairfield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 85,844, Oct. 18, 1929. This application Mar. 28, 1980, Ser. No. 135,042
Int. Cl.[3] C23C 13/04, 13/12
U.S. Cl. 118—722 29 Claims



1. An apparatus for creating an aerosol from a liquid photoresist, comprising in combination;

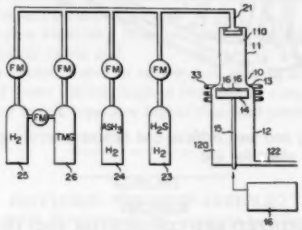
a reservoir of liquid photoresist,

first means providing an acoustic power density of at least 10 $mw.cm^{-2}$ at the surface of the photoresist to cause atomization of the photoresist.

4,290,385
VERTICAL TYPE VAPOR-PHASE GROWTH APPARATUS

Takatosi Nakanisi, Hachioji; Atsushi Tanaka, and Takashi Udagawa, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 5, 1979, Ser. No. 54,949
Claims priority, application Japan, Jun. 14, 1979, 54-75049
Int. Cl.[3] C23C 11/00
U.S. Cl. 118—730 5 Claims



1. A vertical type vapor-phase growth apparatus comprising a vapor-phase growth reactor constituted of an upper section defining an upper chamber having a lateral cross-section of below 200 cm^2, a lower section defining a lower chamber having a lateral cross-sectional area greater than, but smaller than four-times the cross-sectional area of, the upper chamber, and a jointing section connection together the upper and lower sections; a support disposed within the lower chamber and on which a sample is placed, said upper chamber, jointing section and lower chamber lacking gas flow restrictions therebetween; and means for conducting a gas for vapor-phase growth into the upper chamber of the reactor, wherein said support is provided within the lower chamber and near the upper chamber such that an area of a gap as defined between the outer peripheral surface of the support and the inner surface of the reactor and taken in the minimal cross-sectional direction of the gap is made equal to, or smaller than, the lateral cross-section of the upper chamber, wherein said means for conducting a gas into the upper chamber of the reactor comprises gas supply means, a gas introducing duct for supplying the gas from said gas supply means into the upper chamber of the reactor, and gas diffusion means for diffusing the gas from said gas introducing duct, wherein the upper and lower chambers of the reactor are provided concentric with the support, and wherein said support is in pyramid form and has a rounded tip and inclined side surfaces on which a sample is placed.

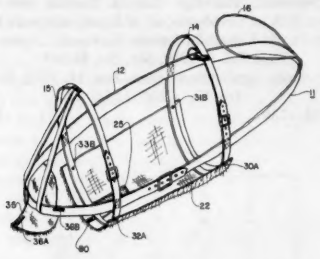
4,290,386
DOG SANITARY DEVICE

Richard Eiriksson, 4352 Verdugo Rd., Los Angeles, Calif. 90067

Filed Sep. 17, 1979, Ser. No. 75,949
Int. Cl.[3] A01K 23/00
U.S. Cl. 119—95 3 Claims

1. In a dog sanitary device of the type including a harness securable about the dog's torso, and a removable receptacle for collection and disposal of bodily waste products, the improvement comprising a harness carried frame and bag collector assembly, said assembly frame comprising a wire member generally U-shaped in horizontal section to extend forward beyond the dog's urinary opening and crescent shaped in vertical section extending upwardly to the dog's anal opening thereby openly encompassing the dog excretory orifices in close proximity to the dog's body, said removable receptacle

comprising precut sheet material foldable over the frame in dog body engaging and receptacle defining relation for both



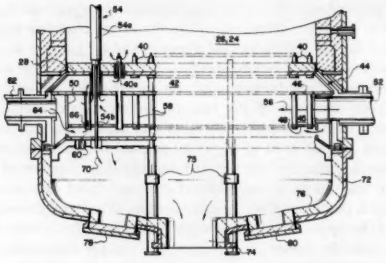
the urinary and anal orifices and fasteners securing the sheet material in place for use.

4,290,387

FLUIDIZED BED COMBUSTOR AND TUBE CONSTRUCTION THEREFOR

Angelo De Feo, Passaic, and William Hosek, Morris, both of N.J., assignors to Curtiss-Wright Corporation, Del.

Filed Oct. 4, 1979, Ser. No. 81,935
Int. Cl.³ F28D *13/00*
U.S. Cl. 122—4 D **18 Claims**



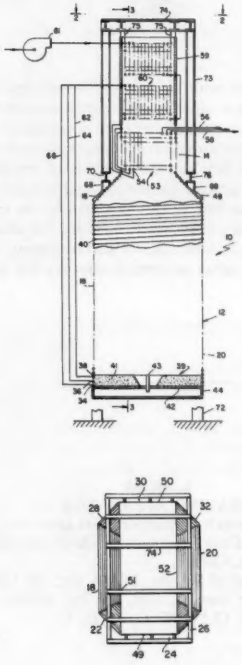
1. A fluidized bed combustor, comprising a housing having interior walls defining a chamber therein, plate means extending across the lower end of said housing chamber defining a fluidizable bed area and a reaction area thereabove, means for directing a fluidizing fluid and fuel into said fluidizable bed and reaction area for burning therein, flue means for the offtake of combustion gases connected into the top of said chamber, a plurality of substantially vertically arranged heat exchanger tube assemblies in said fluidizable bed area each including an outer tube having an upper tube closed end and an inner tube arranged within said outer tube and spaced radially inwardly therefrom and spaced below said upper outer tube closed end, supporting means associated with said plate means supporting the lower ends of said inner and outer tubes so that the lower end of said inner tube extends out of said chamber and defines a fluid discharge end and said outer tube is located above said fluid discharge end of said inner tube and defines an inlet flow passage in the space between said outer and inner tubes, a holding member interconnecting said plurality of heat exchanger tube assemblies adjacent said upper outer tube closed end, said holding member being spaced from and independent of said housing interior walls, and means for circulating a heat exchange fluid into the space between said outer and inner tubes through said inlet flow for flow upwardly in the space between said tubes in the fluidizable bed area to the top of said inner tube and then downwardly therethrough to discharge the fluid from said inner tube, said holding member comprising a collar member connected to each of said tube assemblies and a ring member connected to said collar members.

4,290,388

VAPOR GENERATOR

Anthony Ruhe, Fonthill, and Peter J. Adams, Niagara Falls, both of Canada, assignors to Foster Wheeler Limited, St. Catharines, Canada

Filed Aug. 3, 1979, Ser. No. 63,225
Int. Cl.³ F22B *29/02, 37/24*
U.S. Cl. 122—235 A **10 Claims**

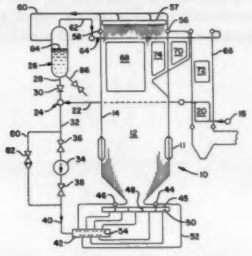


1. A vapor generator for generating vapor from contaminated feed fluid comprising an economizer section; an evaporator section; means for introducing a vaporizable fluid to said economizer section; means for passing said fluid from said economizer section to said evaporator section; said evaporator section including first and second portions, said first portion comprising a plurality of fluid flow tubes defining a furnace enclosure including upright walls and a floor and having an octagonal cross section, said second portion comprising a plurality of fluid flow tubes arranged into a serpentine bundle and adapted to be heated by convection; burner means disposed in said furnace floor for introducing hot gases to said furnace enclosure; means for passing said vaporizable fluid from said first portion of said evaporator section to said second portion of said evaporator section; and means for removing vaporized fluid from said second portion of said evaporator section whereby said feed fluid can be uniformly heated as it flows through said furnace section and can be finally vaporized in a relatively low heat flux zone.

4,290,389
ONCE THROUGH SLIDING PRESSURE STEAM GENERATOR

David Palchik, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 21, 1979, Ser. No. 77,819
Int. Cl.[3] F22D *7/00*
U.S. Cl. 122—406 S 28 Claims

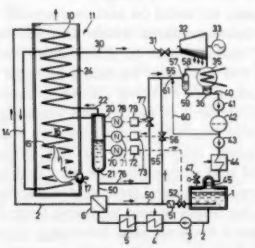


1. A supercritical pressure once-through type steam generator for sliding pressure operation into the subcritical pressure range at reduced loads, comprising: control means for operating said steam generator at supercritical pressure at high loads and at subcritical pressure at low loads; a furnace; vertical tubes lining the walls of said furnace around the periphery thereof, said tubes in parallel flow arrangement and continuous throughout the height of said furnace; internal flow agitating means located within said tubes throughout substantially the entire heated length thereof; a steam-water separating means; means for conveying fluid leaving said tubes to said separating means; a superheater; means for conveying steam from said separating means to said superheater; means for selectively directing substantially the entire flow of fluid leaving said tubes through said superheater; feedwater supply means; means for conveying feedwater to said tubes; means for passing a flow through said tubes exceeding the flow through said superheater during very low load operation of said steam generator; and fixed means for apportioning flow to various of said vertical tubes in proportion to the predicted full load heat absorption of the various tubes.

4,290,390
STEAM GENERATOR

Heinz Juzi, Andelfingen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 17, 1979, Ser. No. 104,428
Claims priority, application Switzerland, Dec. 22, 1978, 13096/78
Int. Cl.[3] F22B *37/62*
U.S. Cl. 122—406 S 12 Claims

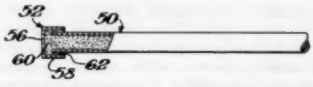


1. In a steam generator, the combination comprising
a feed water tank;
a heat exchanger having a secondary side to receive a flow of water from said feed water tank and a primary side;
an evaporator downstream of said secondary side of said heat exchanger for receiving and evaporating a flow of water therein;
a water separator downstream of said evaporator for separating water from a flow of vapor from said evaporator;
a water outlet pipe connecting said water separator to said feed water tank via said primary side of said heat exchanger to deliver separated water thereto;
a first control valve in said pipe to control the flow of water to said feed tank in response to a predetermined level of water in said separator;
a bypass pipe branching from said outlet pipe upstream of said control valve; and
a second control valve in said bypass pipe to control the flow of water therethrough in response to a second level of water in said separator higher than said predetermined level.

4,290,391
DIFFUSION TREATED ARTICLES

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 25,456, Mar. 30, 1979, Ser. No. 963,313, Nov. 24, 1978, abandoned, and Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,453. This application Nov. 29, 1979, Ser. No. 98,654
Int. Cl.[3] C23C *9/02*; B32B *1/08*
U.S. Cl. 122—511 4 Claims

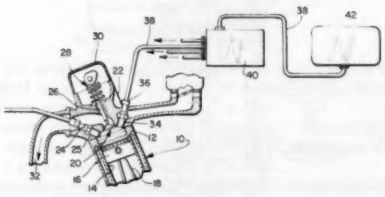


1. A steam boiler having a Croloy boiler tube through which pressurized steam is circulated, said tube being connected to a steam turbine to cause the pressurized steam to operate the turbine, the internal surface of the tube having a chromized case the outer portion of which is rich in chromium carbide and the remainder of which has a columnar chromized structure.

4,290,392
FUEL SYSTEM FOR IC ENGINE

James R. Dissmore, 63 Margaret Rd., East Taunton, Mass. 02780

Filed Oct. 29, 1979, Ser. No. 89,627
Int. Cl.[3] F02D *19/12*
U.S. Cl. 123—1 A 9 Claims



1. An improved manner of operating an internal combustion engine including a combustion chamber, means for directing a hydrocarbon and combustion gas fuel mixture to said chamber and means for igniting said fuel mixture so as to cause a controlled explosion which initiates a power cycle of said engine comprising, directing a charge of a pre-determined amount of an aqueous solution of hydrogen peroxide into said combustion

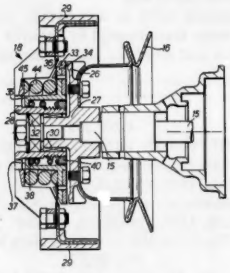
chamber after the initial ignition of said fuel mixture therein and during said power cycle thereof wherein more complete combustion of said hydrocarbon is achieved with an attendant increase in the power and/or fuel efficiency.

4,290,393

FAN UNIT

William B. Hart, 1 Almondhayes, Ipswich, Suffolk, and Rami Domloge, 12 Wilmslow Dr., Ipswich IP2 OXX, Suffolk, both of England

Filed Oct. 27, 1978, Ser. No. 955,200
Int. Cl.³ F01P *7/02*
U.S. Cl. 123—41.12 **11 Claims**



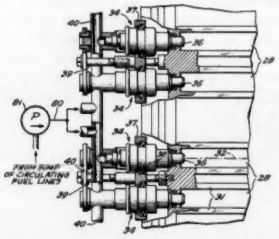
1. A thermally controlled fan unit comprising a rotatable fan; a driving member; engageable driven and driving clutch plates operatively connected to the fan and to the driving member respectively; and a temperature responsive clutch actuating mechanism acting on one of the clutch plates, said mechanism including an element of shape memory effect material, having a variable elastic modulus which varies significantly with temperature over a transition temperature range, and second biasing means acting in opposition to the element; said shape memory effect material having sufficient energy to maintain engagement of said clutch plates; and adjustment means for adjusting said second biasing means acting in opposition to said element of shape memory effect material to adjust the temperature at which the clutch plates are engaged.

4,290,394

TWO-CYCLE ENGINE WITH FUEL INJECTION

Roy W. Frank, and Richard E. Staerzl, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 7, 1980, Ser. No. 128,363
Int. Cl.³ F02B *33/04;* **F02M** *51/00*
U.S. Cl. 123—73 A **11 Claims**



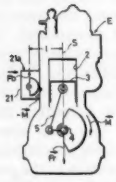
1. In a two-cycle internal-combustion engine comprising at least one cylinder having an associated crankcase with a gas-flow inlet including a check valve, said cylinder having an exhaust outlet independent of the associated crankcase region, means operating in timed relation with a piston in said cylinder for admitting to the associated combustion region gas compressed in the crankcase region, a crankshaft connected to the piston, an electrically operable fuel-injection device associated with said cylinder for injecting fuel into the crankcase region of the cylinder, and control-signal generator means having a synchronizing connection to the crankshaft and having an operating output connection to said fuel-injection device, said control-signal generator means being operative to cause fuel-injection by said device during the period of piston rise to top-cylinder position, and means for selectively varying the interval of crankshaft rotation during which said output connection is operative to cause such fuel-injection.

4,290,395

BALANCING DEVICE FOR AN ENGINE

Kenji Sakano; Masahiro Yamashita; Kenji Yamashita, and Masahiro Aketa, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 14, 1979, Ser. No. 75,411
Claims priority, application Japan, Oct. 12, 1978, 53/126008
Int. Cl.³ F02B *75/06*
U.S. Cl. 123—192 B **8 Claims**



1. A balancing device for attachment to a reciprocating, internal combustion engine for countering the vibrating force $\vec{F}_r$ generated during operation of the engine, said vibrating force $\vec{F}_r$ being directed along a vibration line S, said engine including an engine block having an enlarged crankcase portion in which is housed a crankshaft and a portion of smaller dimensions containing the engine cylinder(s), there being a recessed region adjacent the cylinder-containing portion of said engine block because of the smaller dimensions thereof compared to the crankcase portion of said engine block, and said balancing device comprising:

housing means mounted on said engine; and

balancing means mounted within said housing means, constructed and arranged to generate a selected balancing force $\vec{F}_b$ and a selected balancing moment $-\vec{M}$;

said balancing force $\vec{F}_b$ being chosen to cancel the nth harmonic component of said engine vibrating force $\vec{F}_r$, and said housing means being positioned on said engine within said recessed region adjacent the cylinder-containing portion of said engine block so that said balancing force $\vec{F}_b$ is spaced a distance l from said vibration line S passing through the origin of said vibrating force $\vec{F}_r$;

said distance l between said balancing force F_b and said vibrating force $\vec{F}_r$ resulting in the generation of a rotating moment $\vec{M}$; and

said balancing moment $-\vec{M}$ being chosen to cancel said rotating moment $\vec{M}$.

4,290,396

HEAT CONDUCTING SHIELD FOR CYLINDER HEADS OF INTERNAL COMBUSTION ENGINES

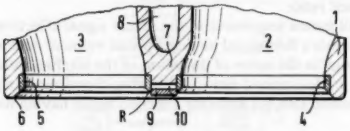
Alfred Urlaub, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nuremberg Aktiengesellchaft, Nuremberg, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,899

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2816923

Int. Cl.[3] F02F *1/26*

U.S. Cl. 123—193 CH 10 Claims



1. In combination, a cylinder head including a side which faces an interior of an engine cylinder for internal combustion engines having a combustion chamber with the interior relative to which at least two gas change ports with centers are provided with valve seat rings at combustion chamber end of the ports, a valve bridge portion between the valve seat rings having outer faces; a heat conducting shield including cylinder head wall members readily subjected to efficient cooling for shielding only the valve bridge portion provided between at least the two gas change ports, said heat conducting shield including the wall members being located on that side of the cylinder head which faces the interior of the cylinder, and said heat conducting shield being provided with a cutout portion for forming an enclosed insulating hollow space between said heat conducting shield including the wall members and said side cylinder head which faces the interior of the cylinder, said head conducting shield being in full contact with the cylinder head in the area of said cylinder head wall members which can be readily cooled wherein said cutout portion includes a recess which in turn includes a longitudinal groove extending with its longitudinal axis in a direction normal to and beyond that of a line intersecting centers of said at least two valve ports.

4,290,397

MOUNTING OR ATTACHING ARRANGEMENT FOR DRIVEN OR NON-DRIVEN ASSEMBLIES ASSOCIATED WITH AN INTERNAL COMBUSTION ENGINE

Joachim H. Sorsche, Stuttgart; Erich Ableitner, Remseck; Ernst Gobien, Weinstadt, and Manfred Minning, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 79,212

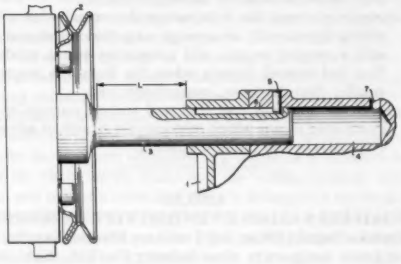
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841774

Int. Cl.[3] F02F *7/00;* F01P *7/10;* F02B *77/14*

U.S. Cl. 123—195 A 4 Claims

1. An arrangement for mounting driven or non-driven assemblies on an internal combustion engine disposed in an engine compartment of a motor vehicle, the assemblies projecting forwardly of the engine when the engine is mounted at a front of the motor vehicle and projecting rearwardly when the engine is mounted at a rear of the vehicle, characterized in that the mounting arrangement includes means for mounting the assemblies on the internal combustion engine so that the assemblies can be displaced in a direction toward the internal combustion engine substantially without any resistance upon an application of a predetermined impact force on the assemblies whereby the "hard length" of the internal combustion engine is reduced so that the energy absorbing capabilities of the body of the motor vehicle may be more fully utilized in the event of an impact.

2. An arrangement according to claim 1, characterized in that one of the assemblies is a cooling fan, and in that the mounting means includes a shaft having the fan rotatably



mounted thereon, and means provided in a housing of the internal combustion engine for accommodating the shaft when the fan is displaced by an impact force acting thereon.

4,290,398

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

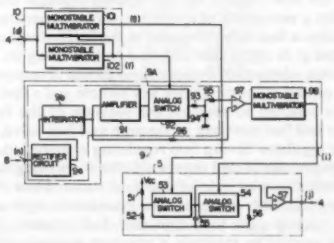
Tadashi Hattori, Okazaki; Kenji Goto, Susono; Daisaku Sawada, Susono; Takashi Shigematu, Susono; Hiroaki Yamaguchi, Anjo; Minoru Nishida, Okazaki, and Teruyoshi Ito, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya; Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, all of, Japan

Filed Apr. 17, 1979, Ser. No. 30,933

Claims priority, application Japan, Apr. 24, 1978, 53-49094

Int. Cl.[3] F02P *5/04*

U.S. Cl. 123—425 11 Claims



1. An apparatus for controlling a timing of ignition sparks supplied to an internal combustion engine having an output shaft comprising:

position detecting means for producing a reference position signal synchronized with the arrival of said output shaft at a predetermined reference position;

computing means for computing an ignition position relative to said reference position signal in response to operating conditions of said internal combustion engine, said computing means producing an ignition signal synchronized with the arrival of said output shaft at said ignition position;

knock detecting means for producing knock signals having magnitudes proportional to respective intensities of knocks of said internal combustion engine;

averaging means for averaging the magnitudes of said knock signals,

interval control means responsive to said ignition signal for limiting the operation of said averaging means to a predetermined constant interval of time measured with respect to the occurrence of said ignition signal, said constant interval of time being independent of the angle of output shaft rotation made by the engine therein;

comparing means for comparing the magnitudes of said knock signals with an average magnitude produced from said averaging means, said comparing means producing first and second outputs when the former is larger and smaller than the latter, respectively; and

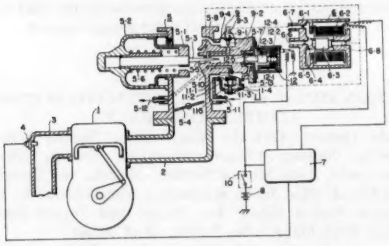
means for applying said first and second outputs to said computing means which responsively retards or advances, respectively said ignition position.

4,290,399

FLOATLESS VARIABLE VENTURI TYPE CARBURETOR

Shigetaka Takada, Ohbu, and Toshiharu Morino, Kuwana, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Jan. 4, 1980, Ser. No. 109,937
Claims priority, application Japan, Jun. 12, 1979, 54-73915
Int. Cl.[3] F02M *7/00, 9/06;* **F02B** *3/00*
U.S. Cl. 123—439 **3 Claims**



1. A variable venturi type carburetor in which fuel discharged to the venturi section of the carburetor is metered by a fuel metering jet which is constructed such that the opening area of the venturi section is changed substantially in proportion to the flow rate of the air flowing through the venturi section by a movement of a variable venturi, characterized by comprising: a fuel valve disposed in the fuel passage and communicated at its outlet side with said fuel metering jet, said fuel valve being adapted to be opened and closed in response to the turning on and off of the engine key switch; and a fuel pressure regulator adapted to regulate the pressure of the fuel introduced to said fuel metering jet through said fuel valve, said fuel pressure regulator having two regulating chambers defined by a diaphragm, one of said regulating chambers being communicated with the inlet side of the fuel valve while the other regulating chamber being in communication with a venturi vacuum pickup port such that said fuel pressure regulator effects a control to maintain a constant pressure differential between the fuel pressure at the inlet side of said fuel metering jet and said venturi vacuum, said fuel pressure regulator being so constructed that its valve mechanism constitutes a part of the fuel return passage to a fuel tank.

4,290,400

CLOSED LOOP FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Allen J. Pomerantz, Bancroft, Mich., assignor to General Motors Corporation, Detroit, Mich.

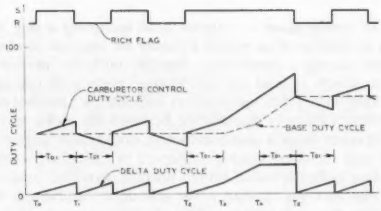
Filed Mar. 17, 1980, Ser. No. 131,085
Int. Cl.[3] F02B *33/00;* **F02M** *7/00*
U.S. Cl. 123—440 **4 Claims**

1. A fuel control system for an internal combustion engine having combustion space into which an air-fuel mixture is supplied to undergo combustion and having means defining an exhaust gas passage from the combustion space into which spent combustion gases are discharged and are directed to the atmosphere comprising, in combination:

supply means effective to supply a mixture of air and fuel to the combustion space;

a sensor responsive to the air/fuel ratio of the exhaust gases at a predetermined point in the exhaust gas passage and, hence, after a transport time delay period dependent upon engine operating conditions, to the mixture supplied to the combustion space, the sensor providing a sensor signal shifting abrupty between two values in accord with the sense of deviation of the air/fuel ratio form a predetermined ratio;

control means responsive to the sensor signal effective to [1] generate a first signal having a preset value of zero at each change in the sense of deviation of the air/fuel ratio from the predetermined ratio and varying therefrom at a predetermined rate, [2] generate a second signal having its value



maintained constant for the period of the engine transport delay following each change in the sense of deviation of the air/fuel ratio from the predetermined ratio and thereafter varying at said predetermined rate and in a sense determined by the sense of deviation of the air/fuel ratio from the predetermined ratio, and (3) provide a control signal having a value in accord with the sum of the values of the first and second signals and varying in said sense determined by the sense of deviation of the air/fuel ratio from the predetermined ratio; and

means responsive to the control signal effective to adjust the air/fuel ratio of the mixture provided by the supply means in a sense tending to restore the predetermined air/fuel ratio and by an amount in accord with the value of the control signal, whereby the control signal is effective to return the air/fuel ratio of the mixture supplied by the supply means to a value substantially equal to the value for producing the predetermined ratio at each change in the sense of the deviation of the air/fuel ratio from the predetermined ratio.

4,290,401

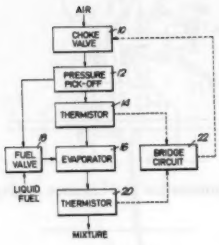
VAPORIZATION MEANS FOR LIQUID FUEL

John R. C. Pedersen, 27, Greenway, Woodmancote, Cheltenham, England

Filed Mar. 23, 1978, Ser. No. 889,293
Int. Cl.[3] F02M *17/18*
U.S. Cl. 123—524 **7 Claims**

1. Vaporization means for liquid fuel, comprising a reservoir for liquid fuel, an air passage for a stream of air, a wick for delivery of fuel in a substantially completely vaporized form and/or with a substantially constant liquid/vapor ratio to a location intermediate the ends of the passage, means for limiting supply of fuel from the reservoir to the wick so that the strength of the resultant mixture of vaporized fuel and air is independent of the air flow, temperature sensitive means, including a thermistor disposed in the air passage upstream of the evaporator, a thermistor disposed in the air passage downstream of the evaporator, said thermistors being connected in a

bridge circuit for monitoring the temperature difference between the incoming air stream and the mixture of vaporized fuel and air, and control means for adjusting the quantity of



fuel supplied from the reservoir to the wick in dependence on the output from the bridge circuit to maintain the mixture strength at a predetermined value.

4,290,402

GAS-OPERATED INTERNAL COMBUSTION ENGINE

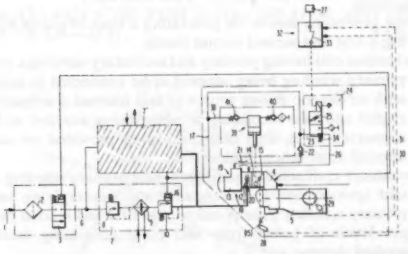
Horst Bergmann, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 138,094

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913864

Int. Cl.³ F02M *13/08*

U.S. Cl. 123—527 **10 Claims**



1. A gas-operated internal combustion engine comprising an air/gas mixer means, a volume control valve means for controlling a flow of a gas stream to the air/gas mixer means, means for biasing the volume control valve means into a closed position, the volume control valve means including a diaphragm means adapted to be exposed on an operating side thereof to a vacuum ambient in the gas downstream of the volume control valve means so as to urge the diaphragm means to an opening position of the control valve means, the diaphragm means on rear side thereof being adapted to be exposed to a control pressure, the engine further including a throttle valve means disposed downstream of the air/gas mixer means and an air supply means having an air filter means disposed upstream of the air/gas mixer means, characterized in that a pressure compensating means is disposed between the rear side of the diaphragm means of the volume control valve means in a portion of the air supply means, one pressure compensating means terminates at or upstream of the air/gas mixer means, a choke means is arranged in the pressure compensating means at one of the air filter means or a housing of the air/gas mixer means, a check valve means is disposed in the pressure compensating means at a position between the choke means and the volume control means, the check valve means opens in a direction toward the choke means, a branch conduit means branches off from the pressure compensating means at a position between the check valve means and the volume control valve means, and in that a reversing valve is arranged in the branch conduit means, the reversing valve means is operable to be selectively switched to a first position enabling the branch conduit means to be opened into the atmosphere through a further choke means and a second position enabling the branch conduit means to be subjected, without impediment, to vacuum ambient in the air/gas mixer means.

4,290,403

METHOD AND APPARATUS FOR PROVIDING OPTIMUM FUEL-TO-AIR RATIO FOR INTERNAL COMBUSTION ENGINE

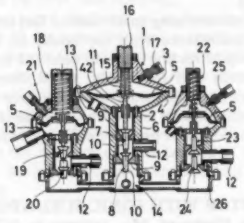
Emmanuel J. Ziniades, 314 Kirstenbosch Flats, 60 Dundalk Ave, Parkview, Johannesburg, Transvaal Province, South Africa

Filed Nov. 23, 1979, Ser. No. 96,670

Claims priority, application South Africa, Nov. 28, 1978, 78/6677

Int. Cl.³ F02M *25/06, 23/00*

U.S. Cl. 123—568 **6 Claims**



2. Apparatus for controlling and providing an optimum fuel-to-air ratio for the fuel mixture for an internal combustion engine having an exhaust conduit and a fuel mixture feed system which includes an inlet manifold and a known type of carburetor comprising:

at least two dual valves each having two inlets, one connectable to the atmosphere and the other to the exhaust conduit, two valve seats, two valve members cooperating with said seats for variably controlling flow respectively of air and exhaust gas through the valve, and outlet means connectable to the inlet manifold for supplying air and exhaust gas thereto;

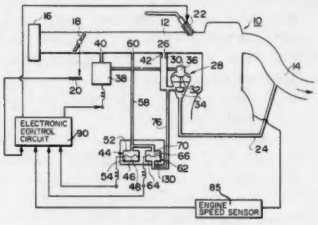
pressure responsive means for each of said valves for simultaneously operating said two valve members thereof; and

means for connecting each of said pressure-responsive means to the fuel mixture feed system at a position of variable pressure therein for operating the corresponding valve to variably control the flow of air and exhaust gas therethrough proportionately to the pressure at said position.

4,290,404
FUEL SUPPLY CONTROL SYSTEM

Yoshitaka Hata, Fujisawa, and Kenji Okamura, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Nov. 13, 1979, Ser. No. 93,672
Claims priority, application Japan, Nov. 30, 1978, 53-147235
Int. Cl.[3] F02M *25/06*
U.S. Cl. 123—571 6 Claims



1. A fuel supply control system for use in an internal combustion engine including an intake passage provided therein with a throttle valve, an exhaust passage, and an exhaust gas recirculation passage connecting said exhaust passage to a first port of said intake passage provided downstream of said throttle valve and containing an exhaust gas recirculation valve, comprising:

(a) a suction vacuum sensor for detecting the engine suction vacuum appearing in said intake passage downstream of said throttle valve,

(b) an orifice provided in said exhaust gas recirculation passage between said first port and said exhaust gas recirculation valve,

(c) a pressure difference sensor for detecting the pressure difference between the opposite sides of said orifice,

(d) a speed sensor for detecting the speed of rotation of said engine, and

(e) means for determining an amount of fuel supplied to said engine in accordance with the intake air flow derived from the engine suction vacuum detected by said suction vacuum sensor and the engine speed detected by said speed sensor and corrected in accordance with the exhaust gas recirculation flow derived by the pressure difference detected by said pressure difference sensor.

4,290,405
CARBURETOR WITH SONIC FUEL ATOMIZER

Larry J. Tipton, Florissant, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 53,935
Int. Cl.[3] F02M *29/00*
U.S. Cl. 123—590 8 Claims

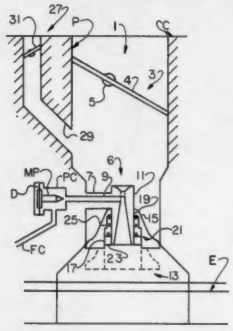
1. In a carburetor for an internal combustion engine, the carburetor having a conduit through which air is drwn into the engine and a source of fuel, the improvement comprising:

means for delivering fuel from the source to the conduit for mixing with air to form an air-fuel mixture combusted in the engine, the fuel delivering means including a chamber to which pressurized fuel is delivered, the chamber having an outlet to the conduit, and a tapered fuel metering pin seating in the outlet, the position of the pin in the outlet being a function of the pressure created in the chamber by fuel delivered thereto and controlling the quantity of fuel delivered to the conduit;

a throttle valve positioned at the inlet to the conduit and movable between a closed and an open position to control the quantity of air drawn into the engine;

means defining an outlet for the fuel to be delivered to the conduit, fuel discharged through the outlet being atomized by the air flowing past the outlet; and

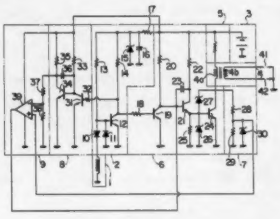
means for causing the air flowing past the fuel outlet to flow therepast at substantially sonic velocities thereby to improve fuel atomization and enhance mixing of the air and fuel.



4,290,406
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Michio Iyoda, Aichi, and Shigeya Abe, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 26, 1979, Ser. No. 6,914
Claims priority, application Japan, Mar. 14, 1978, 53/29588
Int. Cl.[3] F02P *3/04, 11/00*
U.S. Cl. 123—645 7 Claims



1. An ignition system for an internal combustion engine comprising:

pulse generating means for generating a train of pulses having a first and second output levels;

an ignition coil having primary and secondary windings, said primary winding being adapted to be connected in series with an electric power source of said internal combustion engine and said secondary winding being adapted to be connected to at least one spark plug provided on said internal combustion engine;

a transistor connected in series with said primary winding of said ignition coil for energizing and deenergizing said primary winding in response to said first and second output levels of pulses from said pulse generating means applied thereto; and

transistor control means for (a) controlling the currents of said transistor in response to the transition of said pulses from said second to first output levels so that an energization current flowing from said electric power source through said primary winding is gradually increased in accordance with a first time constant after the transition of said output pulses from said second to first output levels and (b) controlling the currents of said transistor in response to the transition of said pulses from said first to second output levels so that a deenergization current flows in said primary winding that changes in accordance

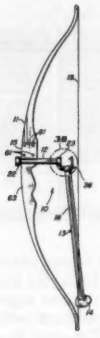
with a second time constant shorter than said first time constant.

4,290,407

ARCHERY GUIDING DEVICE FOR ARCHERY BOW

William M. Damron, 1145 W. Harvest, Mesa, Ariz. 85201

Filed Jan. 9, 1979, Ser. No. 2,224
Int. Cl.³ F41B 5/00
U.S. Cl. 124—41 A **6 Claims**



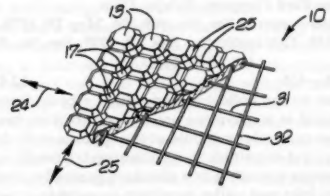
1. A guiding and launching device for arrows comprising:
a hollow launching tube assembly,
attachment means for fastening said assembly at one end thereof to the spine point of a bow,
means attached to a bow for pivotally moving at least a part of said assembly relative to the longitudinal axis of a bow for moving at least a part of said assembly into arrow launching position and to a position adjacent the longitudinal axis of a bow for carrying and storage purposes, and
a butt member fastened to the other end of said assembly for engaging the jawbone of a user when said assembly is in arrow launching position.

4,290,408

REFRACTORY LATTICE AND FABRICATION

George C. Juett, Pasadena, and Donald H. Rez, 301 36th St., Newport Beach, Calif. 92663, assignors to Donald H. Rez and Betty Rez, both of Newport Beach, Calif.

Filed Jan. 22, 1979, Ser. No. 5,306
Int. Cl.³ A47J 37/00; F23H 13/00; C04B 33/34; A01J 43/20
U.S. Cl. 126—25 R **6 Claims**



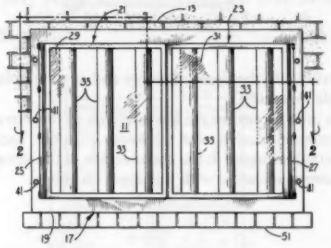
1. In combination with an upper grille to support an edible, and a flame source spaced below the grille, the grille supported by a shell, the improvement comprising
(a) a series of integrally interconnected refractory briquettes forming a generally horizontally extending lattice spaced below the grille and above said flame source.
(b) metallic members projecting lengthwise through multiple of said briquettes and confined within the lattice to reinforce same, said members protected against direct flame contact by extents of said refractory briquettes therebeneath,
(c) whereby the briquettes will be heated by flames rising from said source to radiate heat upwardly to the cooking zone, and the metallic members will not be directly exposed to said flames,
(d) said briquettes being arranged in rows and columns, and there being vertical openings formed through the lattice, between diagonally related briquettes, said openings also spaced apart in rows and columns.

4,290,409

FIREPLACE GLASS DOOR WITH HEAT CIRCULATOR

Carlos Mayo, Springdale, Ark., assignor to C. Mayo, Inc., Springdale, Ark.

Filed Oct. 12, 1979, Ser. No. 84,080
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 **8 Claims**



1. A fireplace screen comprising
a frame with a central opening adapted to be attached to a fireplace,
at least one door having a top and a bottom and supported by and extending outwardly from said frame and movable to cover and uncover said opening,
said door having a thickness of at least one inch from its inner side to its outer side and a transparent glass pane mounted therein spaced from the inner side of said door,
at least two elongated tubular air ducts open at both ends, spaced apart from each other, extending vertically in said door, located toward the inner side of said door from said glass pane, and each having a wall which absorbs radiant heat from the fireplace causing heating of air in said duct, said door having openings communicating with said open duct ends.

4,290,410

COAL STOVE

Lawrence E. Trainer, Box 205, Bryantville, Mass. 02327

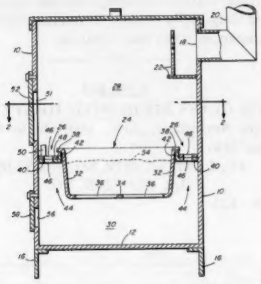
Filed Feb. 26, 1979, Ser. No. 15,446
Int. Cl.³ F23M 5/00
U.S. Cl. 126—146 **13 Claims**

1. A coal stove comprising:
a heat conductive stove body having a stove sidewall, a bottom wall and a cover;
a fire pot adapted to receive a load of coal, the fire pot having an apertured bottom wall defining a grate and a sidewall extending upwardly from the bottom wall;
means for supporting the fire pot within the lower region of the stove;
said fire pot and said supporting means being constructed and arranged so that the sidewall of the fire pot is spaced from the sidewall of the stove body thereby defining an annular space between the sidewall of the fire pot and the stove sidewall;
an annular member extending between the stove sidewall and the upper end of the sidewall of the fire pot, the region of the stove above the annular member defining an upper

chamber and the region of the stove below the annular member defining a lower chamber;

aperture means formed in the annular member for communication between the annular space and the upper chamber;

means for controlling the flow of air through the aperture means to enable air to flow from the annular space, upwardly into the upper chamber and at a variable, controllable flow rate;



an air inlet formed in the lower region of the stove sidewall in communication with the lower chamber; and

a flue outlet formed in the upper region of the stove sidewall in communication with the upper chamber.

4,290,411

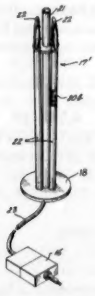
SOLAR ENERGY COLLECTOR SUN-TRACKING APPARATUS AND METHOD

George F. Russell, 8513-42nd Ave. West, Tacoma, Wash. 98466

Filed Jun. 5, 1978, Ser. No. 912,456

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—425 **6 Claims**



1. In a sensing mechanism including a photoelectric cell for sun-tracking apparatus having an insolation receiver to be directed toward the sun and an elongated shield tube housing the photoelectric cell for exposing the cell to the rays of the sun while shielding the cell from stray light, the improvement comprising canting the end of the shield tube to enable the rays of the sun to expose the cell when the angle between the direction of the sun's rays and the longitudinal axis of the shield tube is toward the lower side of the cant from the tube's longitudinal axis.

4,290,412

SOLAR COLLECTOR AND PROCESS FOR ITS OPERATION

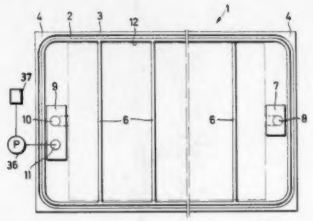
Ralf Krauss, Palma de Mallorca, Spain, assignor to Walter Steinrücke, Cologne, Fed. Rep. of Germany

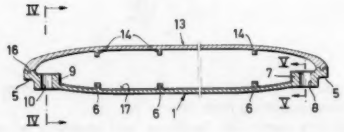
Filed Jan. 31, 1979, Ser. No. 8,126

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1978, 2804746; Apr. 2, 1978, 2804863; Oct. 6, 1978, 2825509

Int. Cl.³ F24J *3/02;* **F28F** *13/00*

U.S. Cl. 126—419 **31 Claims**





1. A solar collector assembly comprising:

(a) a hollow housing at least partially transparent to solar rays,

(b) absorber means disposed in the housing to receive said solar rays,

(c) vacuum pump means connected to maintain a normally vacuum insulating effect around the absorber means inside of the housing,

(d) means for sensing the heat radiation of prevailing ambient atmospheric conditions, and

(e) switching means responsive to said sensing means to turn off the vacuum pump means and ventilate to completely neutralize said insulating effect.

4,290,413

SOLAR ENERGY COLLECTOR

Ronald D. Goodman, Sylvania; Wallace F. Krueger, Toledo, and Anthony R. Shaw, Waterville, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation-in-part of Ser. No. 909,204, May 25, 1978, Pat. No. 4,206,748. This application Sep. 19, 1979, Ser. No. 76,817

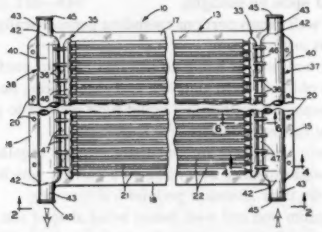
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—426 **13 Claims**

1. A solar energy collector comprising: a body formed of plastic material in a one-piece unitary construction having a primary inlet and outlet manifold at the opposite ends thereof, respectively, and a multiplicity of elongated, laterally spaced parallel passages extending in a direction generally normal to said primary inlet and outlet manifolds to provide cross fluid flow paths therebetween, and secondary inlet and outlet manifolds parallel to said primary manifolds, respectively, said secondary manifolds interposed between said primary manifolds and said passages, said secondary and primary manifolds being interconnected by a plurality of cross passages for fluid flow, each of said cross passages tapering in cross-sectional area from the primary to the secondary manifold.

13. A solar energy collector comprising: a body formed of plastic material in a one-piece unitary construction having a primary inlet and outlet manifold at the opposite ends thereof,

respectively, and a multiplicity of elongated, laterally spaced parallel passages extending in a direction generally normal to said primary inlet and outlet manifolds to provide cross fluid flow paths therebetween, and secondary inlet and outlet manifolds parallel to said primary manifolds, respectively, said secondary manifolds interposed between said primary manifolds and said passages and establishing communication therebetween, said body being formed of a pair of sheet members



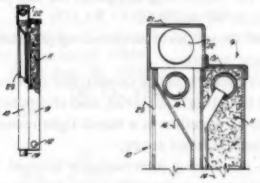
fused together along laterally spaced lines substantially lengthwise of said body to form elongated webs between said passages, each of said passages being formed by oppositely displaced portions of said sheet members between said webs and defined by an upper wall formation above said web and a lower wall formation below said web, and an inlet restriction adjacent at least one end of each passage formed by maintaining the lower wall in the same plane as said web thereby reducing the cross sectional area of said passage.

4,290,414

SOLAR HEATING COLLECTORS

John Sharp, P.O. Box 198, St. Leonards, New South, Wales, 2065, Australia

Filed Aug. 7, 1979, Ser. No. 64,637
Int. Cl.³ F24J *3/02*; F28F *9/02*
U.S. Cl. 126—429 **3 Claims**



1. A solar energy collector comprising:

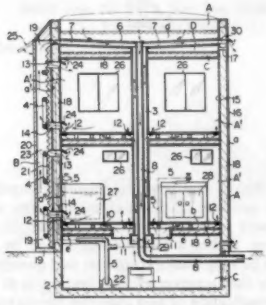
a first and a second tray-like member resting one upon the other and secured together, each tray-like member including a floor and top, and sidewalls interconnecting said floor and top, said first tray-like member containing on opposite ends thereof respective fluid inlet and outlet headers, a plurality of thermally conductive tubes extending between said fluid inlet and outlet headers in thermal contact with the top wall of said first tray-like member, and an insulating material filling the interior space of said first tray-like member, the top of said first tray-like member forming the floor of said second tray-like member and being formed of heat absorbing material, said first tray-like member top having undulations therein respectively accomodating said plurality of tubes, said second tray-like member containing an additional heat absorbing wall between the top and floor thereof, said additional wall contacting with the crests of the undulations in the top of said first tray-like member to define a plurality of ducts between neighboring undulations, the cross-section of the ducts being greater than the cross-section of the tubes, said second tray-like member including an inlet header and outlet header connected to opposite ends of said ducts and the top of said second tray-like member being formed of a material transparent to light.

4,290,415

BUILDING FOR COLD DISTRICTS

Tadao Tatsumi, No. 7, Higashi 6-jo 6-chome, Asahikawa-shi, Hokkaido, Japan

Filed Nov. 30, 1979, Ser. No. 98,745
Claims priority, application Japan, Mar. 17, 1979, 54-34455[U]; May 14, 1979, 54-59480; Aug. 14, 1979, 54-103811
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **10 Claims**



1. A building for cold districts, said building having a semi-basement and a roof comprising:

a room heater unit provided within said semi-basement, heat insulation materials provided on outer side walls and bottom of said building and also a bottom portion of a narrow space under said roof of said building for heat insulating the interior of said building from external atmosphere;

passage means each provided under a floor of each room of said building and communicating with said semi-basement such that warm air produced from said room heater unit is supplied through each of said passage means and to each room through the floor thereof, and

a vertical solar heat absorption system having a heat collection path of a predetermined cross sectional area, and provided on a sunny side outer wall of said building, and at least two of the rooms of said building each having at least two vertically spaced ports communicating each said room with said solar heat absorption system; a warm air duct having a cross sectional area less than that of said heat collection path, and provided along the underside of said roof of said building and communicating with an upper end portion of said solar heat absorption system and a circulation path vertically extending from said warm air duct through the interior of said building into said semi-basement,

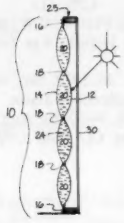
whereby air in said rooms may be supplied to said solar heat absorption system via said ports, and whereby said air supplied via said ports is heated and expanded in said solar heat absorption system and may be returned to said rooms via said ports.

4,290,416

PHASE CHANGE ENERGY STORAGE PANEL FOR ENVIRONMENTALLY DRIVEN HEATING AND COOLING SYSTEM

Timothy Maloney, Winchester, Va., assignor to One Design, Inc., Winchester, Va.

Filed Sep. 13, 1978, Ser. No. 942,132
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—430 22 Claims



1. A phase change energy storage panel, comprising:
at least one quantum of phase change energy storage medium capable of gaining and losing heat of fusion in a temperature within a temperature range to which the panel is to be subjected during use; said quantum being of sufficiently thin transverse cross section as to avoid permanent stratification of said quantum throughout substantially the full thickness thereof during such use;
a cell having wall means including an outer face and an inner face and enveloping each such quantum, said cell wall means including portions constructed and arranged to be engaged for supporting the panel for the panel to be impinged upon by sunlight;
said cell wall means portions extending perimetrically of said at least one quantum;
said cell wall means being constituted by two confronting sheets of liquid-tight material; said sheets being perimetrically seamed together in a liquid-tight manner to provide at least one enclosed space;
said sheets also being intermedially seamed together in a liquid-tight manner according to a pattern which is bordered by their aforesaid perimetrical seaming;
said seaming also including portions constructed and arranged to be engaged for supporting the panel for the panel to be impinged upon by sunlight;
said cell wall means portions are free of direct communication with each said quantum, so that fasteners may be secured therethrough for supporting the panel without permitting leakage of molten phase change energy storage medium from said panel;
framing means for supporting the panel; and
fasteners securing the panel at said portions to said framing means;
the framing means are constituted by housing structure framing including studs; and
said cell extending widthwise from one said stud to an adjacent next one of said studs.

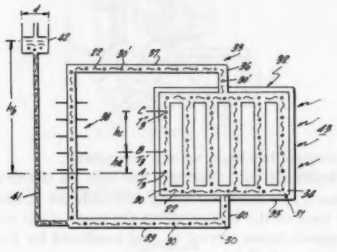
6. A phase change energy storage panel, comprising:
at least one quantum of phase change energy storage medium capable of gaining and losing heat of fusion in a temperature within a temperature range to which the panel is to be subjected during use; said quantum being of sufficiently thin transverse cross section as to avoid permanent stratification of said quantum throughout substantially the full thickness thereof during such use;
a cell having wall means including an outer face and an inner face and enveloping each said quantum, said cell wall means including portions constructed and arranged to be engaged for supporting the panel for the panel to be impinged upon by sunlight;
said cell wall means portions extending perimetrically of said at least one quantum;
said cell wall means being constituted by two confronting sheets of liquid-tight material; said sheets being perimetrically seamed together in a liquid-tight manner to provide at least one enclosed space;
said sheets also being intermedially seamed together in a liquid-tight manner according to a pattern which is bordered by their aforesaid perimetrical seaming;
said quantum and cell wall means being shaped and associated comparably, respectively, to the gypsum filing and covering sheet material of conventional gypsum board dry wall paneling, including tape joint trough means extending along two opposed edges thereof on one face thereof, so that said phase change energy storage panel may be hung, taped and spackled much like conventional dry wall paneling.

7. A phase change energy storage panel, comprising:
at least one quantum of phase change energy storage medium capable of gaining and losing heat of fusion in a temperature within a temperature range to which the panel is to be subjected during use; said quantum being of sufficiently thin transverse cross section as to avoid permanent stratification of said quantum throughout substantially the full thickness thereof during such use;
a cell having wall means including an outer face and an inner face and enveloping such said quantum, said cell wall means including portions constructed and arranged to be engaged for supporting the panel for the panel to be impinged upon by sunlight;
said cell wall means portions extending perimetrically of said at least one quantum;
said cell wall means being constituted by two confronting sheets of liquid-tight material; said sheets being perimetrically seamed together in a liquid-tight manner to provide at least one enclosed space;
said sheets also being intermedially seamed together in a liquid-tight manner according to a pattern which extends to and is bordered by their aforesaid perimetrical seaming, whereby said enclosed at least one space is divided into a plurality of individual cells in a two-dimensional array;
there being a said quantum in each such cell;
framing means for supporting the panel; and
fasteners securing the panel at said portions to said framing means;
a panel of glazing ranked relatively outside said cell wall means, in a confronting manner, with a space therebetween; and
wall means perimetrically substantially enclosing the last-mentioned space, to provide an air chamber between the at least one cell-enveloped quantum of phase change energy storage medium and the panel of glazing; and
pivot means mounting the framing means for movement of each cell through about 180 degrees between a first position wherein said outer face is presented outwardly and a second position wherein said outer face is presented inwardly.

4,290,417
SOLAR HEAT SYSTEM USING GRAVITATIONAL CIRCULATION OF HEATED TRANSFER MEDIUM

Melville F. Peters, Livingston, N.J., and Walter T. Peters, Harbor Rd., East Dennis, Mass. 02641, assignors to Walter Todd Peters; Margot E. Peters, both of East Dennis, Mass. and Albert F. Kronman, Locust Valley, N.Y.

Filed Jul. 18, 1979, Ser. No. 58,741
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—434 **9 Claims**

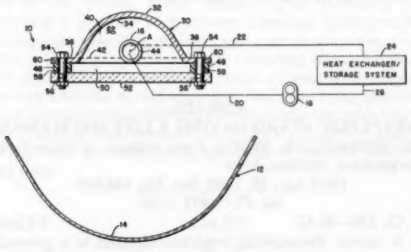


1. A solar heating system comprising solar collecting means enclosing a heat absorbing medium, fluid storage means communicating with said collecting means; at least one radiator receiving heat from said medium; a heat exchanger connected between said collecting means and said storage means cooperating with the fluid storage to preheat the heat absorbing medium; thermostatically operated valves between said exchanger, said collecting means and said storage means; said medium containing an emulsifier and at least two additives having different boiling points vaporizable at a temperature below the boiling point of said medium to cause flow of said medium through said entire system by gravitational circulation said additives having a combined vapor pressure at their peak operating temperatures which is lower than the safe operating pressure of the system.

4,290,418
SOLAR COLLECTORS

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio

Filed Jun. 25, 1979, Ser. No. 52,087
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **3 Claims**

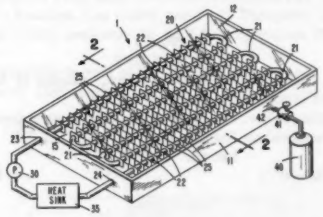


1. A solar energy collector comprising:
an elongated reflector element for receiving the beam component of solar radiation and focusing it generally along a focal (line) axis;
an elongated trough like element having a substantially uniform cross-section between its ends and including a concave reflective surface facing said reflector element, said trough like element having flanges integral with the marginal edges thereof, said flanges being in substantially the same plane, said trough like element further including end walls and flanges interconnecting the flanges along said marginal edges and being in the same plane to form a continuous perimeter flange;
an elongated receiver comprising a tubular element extending through said trough and generally coextensive with said focal line, said tubular element providing a passage for heat transfer fluid through said collector;
a flat plate covering said trough, said plate being transparent to solar radiation (: and);
a continuous perimeter seal between the side and end flanges of said trough and said plate, (whereby the) said space therebetween (may be made) being subatmospheric; and,
a plurality of discrete fasteners in contact with said plate and said flanges and spaced from one another substantially uniformly around the perimeter flange, said fasteners extending through said transparent sheet and said perimeter flange for placing said continuous perimeter seal in compression.

4,290,419
MULTI SYSTEMS SOLAR COLLECTOR

Richard W. Rabedeaux, 104 N. Second Ave. East, Newton, Iowa 50208

Filed Jun. 28, 1979, Ser. No. 52,850
Int. Cl.³ F24J *3/02;* **E06B** *7/12*
U.S. Cl. 126—450 **5 Claims**



1. A multi system solar collector assembly comprising:
an insulated framework having a thermally insulated cover forming a chamber within the framework;
a finned heat pipe collector tube having a plurality of serpentine coils disposed within the framework;
a heat transfer fluid disposed in the collector tube; and
a pressurized atmosphere within the chamber, comprising a dry gas, wherein said pressurized atmosphere has a value greater than atmospheric pressure, which is maintained by a pressure regulator operatively connected to said chamber; and whereby the solar collector assembly will transfer conduction, convection and radiant energy to said heat transfer fluid.

4,290,420
STRESS INCONTINENCE DIAGNOSTIC AND TREATMENT DEVICE

Alberto Manetta, 2729 Eighth Ave., Altoona, Pa. 16602

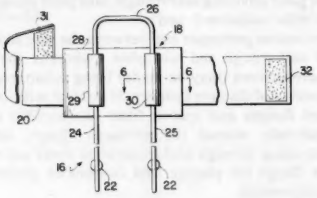
Filed Jun. 9, 1980, Ser. No. 157,795
Int. Cl.³ A61M *31/00*
U.S. Cl. 128—1 R **5 Claims**

1. A device for use in diagnosis or treatment of stress urinary incontinence in a patient comprising
a pressure member including a generally U-shaped body of deformable metal having
first and second elongated legs in substantially parallel relationship having a support therebetween,
the end portions of said legs being bent to form an angle of less than 90° with said legs, said end portions being insertable into the vagina of the patient with the distal ends thereof pressing upwardly against the anterior wall of the vagina to modify the urethrovesical angle with

the support portion adapted to abut against the abdomen, and

a coating of physiologically inert polymeric material covering said legs; and

a support for holding said body against the lower abdomen of the patient, including



a plate having means attached to the leg portions adjacent the support portion for holding said legs in substantially parallel relationship; and

belt means attached to said plate for surrounding the trunk of the patient and for holding said plate against the patient.

4,290,421

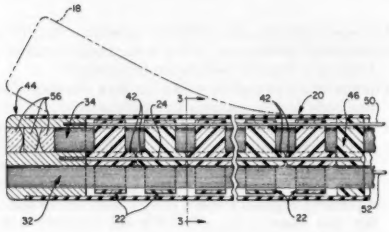
FIBERSCOPE

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 1,670, Jan. 8, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 161,725

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **5 Claims**



1. In a fiberscope probe for use in an endoscope having an articulable distal section, the improvement comprising:

a series of webbed vertebrae in said distal section of said probe each having three approximately equally circumferentially spaced openings through which endoscope illuminating and image-conducting fiber bundles and biopsy channelling may be extended and a centrally disposed doubled-ended hinge portion, said hinge portions being adjoined successionally;

means for retaining said hinge portions in said adjoined relationship while permitting universal hinging thereof one relative to another; and

operating wire means extending peripherally through said series of vertebrae for use in effecting said hinging thereof, said operating wire means comprising three wires approximatey equally circumferentially spaced from one another about said periphery of said vertebrae, said wires being anchored in said fiberscope probe adjacent one end of said series of vertebrae.

4,290,422

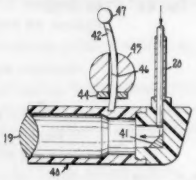
SURGICAL HEADLIGHT SYSTEM

Charles V. Burton, 18409 Minnetonka Blvd., Deephaven, Minn. 55391

Filed Jul. 5, 1979, Ser. No. 54,825

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—23 **2 Claims**



1. A surgical headlight system comprising:

(a) a headband for supporting the light on the head of the wearer, said headband being adaptable for positioning on the head of the wearer above the level of the eyes;

(b) support means carried by said headband for frictionally engaging a ball joint member;

(c) a ball joint member frictionally engaged with said support means;

(d) elongated light projecting means having an axis of elongation spaced from said ball joint member, said projecting means carried by and below said ball joint member and disposed for easy movement in all directions in a continuum of positions wherein light is emitted from said projecting means along the axis of elongation and generally away from said headband, wherein the light projecting means is connected to a fiber optic light cable which transmits light from a light source to said light projecting means, said fiber optic light cable entering said light projecting means at an angle of about 90° relative to the central axis of the light projecting means; and

(e) adjusting means, connecting said ball joint member to said light projecting means, for varying the distance between said ball joint member and said light projecting means so that said axis of elongation can be positioned proximate the axes of vision of the wearer's eyes;

(f) wherein said adjusting means comprises a shaft carried by said light projecting means and extending in frictional engagement through an aperture in said ball joint member whereby moving said shaft through said aperture will cause the light projecting means to be raised or lowered.

4,290,423

PARAPLEGIC STAND HAVING A LIFT MECHANISM

Henry Kleinwolterink, Sheldon, Iowa, assignor to Main-Tainer Corporation, Sheldon, Iowa

Filed Apr. 25, 1980, Ser. No. 143,839

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 G **9 Claims**

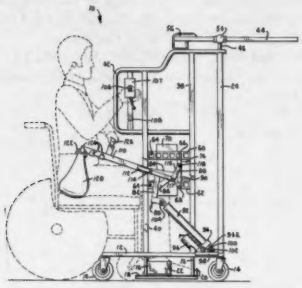
1. A device for assisting a patient to stand in a generally upright position, said device comprising:

a substantially upright frame having a platform for receiving the feet of the patient;

a pair of lift arms mounted to said frame for movement between a raised position and a lowered position;

sling means carried on said lift arms and adapted to be drawn behind the back of the patient when the patient is in a sitting position and said lift arms are in the lowered position, said sling means being raised with said lift arms to raise the patient to an upright standing position on said

platform in response to movement of the lift arms to the raised position; and



power means for effecting movement of said lift arms between the lowered and raised positions.

4,290,424

PLASTER CUTTING WIRE, PLASTER CAST OR DRESSING COMPRISING SUCH WIRE AND METHOD OF MANUFACTURING SUCH A PLASTER CAST OR DRESSING

Karl I. Wahl, Ekerö, and Lars G. Lindström, Sundbyberg, both of Sweden, assignors to Landstingens Inkopscentral, Ekonomisk Forening, Solna, Sweden

Filed Nov. 21, 1979, Ser. No. 96,296
Claims priority, application Sweden, Nov. 29, 1978, 7812318
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—91 A **10 Claims**

1. A cast cutting device comprising an anchoring plate including a plurality of apertures extending therethrough, a cutting wire extending through said apertures to support said plate, a first segment of said wire extending through a first of said apertures and a second segment of said wire extending through a second of said apertures, said plate being positioned upon said wire substantially intermediate the two ends thereof, and a latching means attached to said first and second segments of said wire for maintaining said plate in position relative to said wire.

4,290,425

INFANT SUPPORT BOARD

Joel N. Helfer, New Haven, and Elisa M. Ferrara, Hartford, both of Conn., assignors to American Home Products Corporation, New York, N.Y.

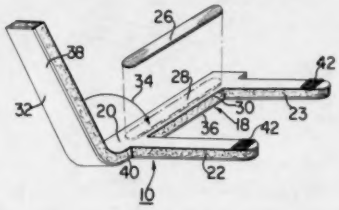
Filed Nov. 30, 1979, Ser. No. 99,168
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—133 **7 Claims**

1. A support board for use in securing an extremity of an infant against motion while infusing fluids intravenously in said extremity, comprising:

a rigid support member; and

means for affixing the support member to the extremity comprising a pad of flexible material shaped to form a plurality of flexible straps for holding the support board to the extremity;

the pad of flexible material being folded over and overlapping the support member;



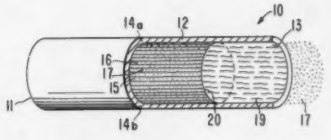
the flexible material being affixed to itself where it overlaps the support member to retain the support member therebetween.

4,290,426

DISPENSER FOR DISPENSING BENEFICIAL AGENT

Joseph G. Luschen, Los Gatos, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 902,678, May 4, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,515
Int. Cl.³ A61M *7/00*
U.S. Cl. 128—260 **25 Claims**



1. A dispenser for the controlled dispensing of a beneficial agent to a fluid environment of use, the dispenser comprising:

(a) a container having a wall impermeable to fluid and impermeable to agent, said wall surrounding an internal reservoir having an uniform measurement along a given dimension;

(b) a passageway in the container connecting the reservoir with the exterior of the dispenser, said passageway having an area that permits entry of fluid into the reservoir, and release of beneficial agent from the reservoir;

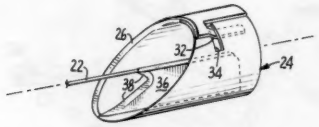
(c) means in the reservoir for dispensing the beneficial agent from the dispenser, said means (1) occupying a volume having a constant cross-sectional area parallel to the passageway and housing the beneficial agent therein, (2) absorbs fluid that enters the reservoir and undergoes fluid induced relaxation from an unrelaxed to a relaxed state, with (3) the beneficial agent exhibiting an increased coefficient of diffusion in the relaxed means; and,

(d) wherein, when the dispenser is in operation in the fluid environment of use, beneficial agent is dispensed by diffusion through the relaxed means and the passageway at a controlled rate from the dispenser in an amount that corresponds to the amount of agent within the means that goes from an unrelaxed to a relaxed state, which relaxation occurs at a rate governed by the progressive fluid absorption and accompanying induced relaxation of the means over time.

4,290,427
ENDARTERECTOMY APPARATUS

Albert K. Chin, San Francisco, Calif., assignor to Thomas J. Fogarty, Palo Alto, Calif.

Filed Nov. 26, 1979, Ser. No. 97,206
Int. Cl.[3] A61B *17/32*
U.S. Cl. 128—304 4 Claims

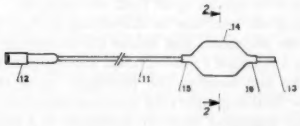


1. In an endarterectomy instrument comprising an annular knife having a cutting adge at one end thereof, said knife being split longitudinally and having overlapped end portions to thereby enable said knife to be yieldingly compressible radially for insertion within an artery and to thereafter enable said knife to apply a substantially constant outwardly directed pressure against said artery as an arteriosclerotic occlusion is being excised, and having a wire carrier attached thereto whereby said knife may be moved along an occluded artery to excise said occlusion therefrom, said cutting edge being located at the end of the knife from which said wire carrier extends the provision of attachment means carried by said knife and positioned bodily within the axial confines and centrally of said knife for connecting said wire carrier thereto along substantially the longitudinal axis of said knife, said attachment means including a cutting edge to enable said means to cut through an occlusion being excised by said knife.

4,290,428
CATHETER WITH BULB

Alain J. M. Durand, 12, Rue Jean-Jaures, F-95600 Eaubonne, and Jean C. Farcot, 18, Parc du Bearn, F-92210 Saint-Cloud, both of France

Filed Aug. 16, 1979, Ser. No. 67,161
Claims priority, application France, Sep. 1, 1978, 78 25254
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—349 B 2 Claims

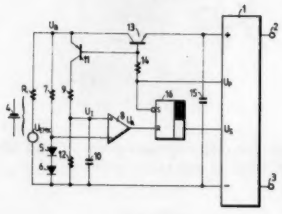


1. A catheter for blood retroperfusion, which comprises a tube of which the inner fluid passage opens directly into a bulb secured non-detachably to said tube, said bulb further comprising an orifice communicating with the cavity into which the catheter is introduced in actual use, wherein the total surface area of the communication ports between said tube fluid passage and the inner space of said bulb is at least equal to the total surface area of the orifice permitting the communication between the inner space of said bulb and the cavity into which the catheter is introduced.

4,290,429
BATTERY MONITORING CIRCUIT IN A CARDIAC PACEMAKER

Reinhard Blaser, Büdingen, Fed. Rep. of Germany, assignor to Biotronick Mess-und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 136,094
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1979, 2913399
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—419 PT 7 Claims

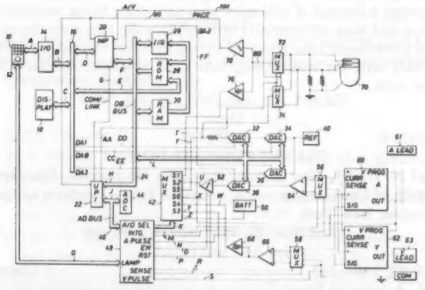


1. In a monitoring circuit for monitoring the state of the battery of a cardiac pacemaker, which pacemaker includes an energy storage element normally connected to be charged by the battery and to constitute an energy source for the pacemaker components, the circuit including a voltage detector connected to emit a signal when a parameter representative of the battery state passes a threshold value, the improvement comprising: first switching means for disconnecting the battery from the energy storage element during periodically recurring time periods of given duration; means defining a fixed load having an impedance which is large compared to the internal resistance of the battery and connected to apply to said voltage detector a voltage representative of the current flowing through said fixed load; means for connecting said load across the battery during each said time period for causing said load to be supplied with a current having a value at least indirectly defining the parameter representative of the battery state; and storage means connected to provide an indication of the emission of such signal by said voltage detector.

4,290,430
PACER ANALYZER

Daniel Bihn, Aptos, Calif., and Pat L. Gordon, West Columbia, Tex., assignors to Intermedics, Inc., Freeport, Tex.

Filed Jun. 5, 1980, Ser. No. 156,646
Int. Cl.[3] A61N *1/00*
U.S. Cl. 128—419 PT 14 Claims



1. A pacer system analyzer for determining compatibility between a selected implantable pacer and a patient within which the pacer is to be implanted, comprising:

means for storing a digital representation of an actual cardiac waveform from said patient;

means connectable to said pacer for converting said digital representation to an analog output signal for presentation to said pacer; and

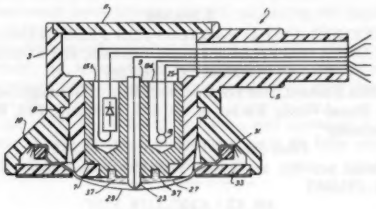
means connectable to said pacer for detecting a responses of said pacer to said analog output signal.

4,290,431

TRANSCUTANEOUS OXYGEN AND LOCAL PERFUSION MEASUREMENT

Normand C. Herbert, Goffstown, N.H.; Richard S. Burwen, Lexington, Mass., and Richard A. Mentelos, Hamden, Conn., assignors to Novametrix Medical Systems, Inc., Wallingford, Conn.

Filed Jun. 21, 1979, Ser. No. 50,691
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **8 Claims**



1. In a transcutaneous gas measurement probe including first and second electrodes, means for maintaining an electrolytic solution in contact with said first and second electrodes, means permeable to the gas to be measured in contact with said electrolytic solution and adapted to contact the surface at which said gas is transcutaneous, and means for maintaining said probe at substantially constant temperature, the improvement wherein said temperature maintaining means comprises

a semi-conductor device mounted in thermal transmitting relationship to said probe,

heater circuit means connected to said semi-conductor device for applying a controlled amount of current thereto for maintaining the temperature of said probe at a substantially constant predetermined temperature,

a first voltage producing means connected in parallel with said semi-conductor device for producing a first voltage having a magnitude proportional to the voltage across said semi-conductor device,

a second voltage producing means operatively connected to said semi-conductor device so as to conduct a current passing through said semi-conductor device for producing a second voltage having a magnitude proportional to said current,

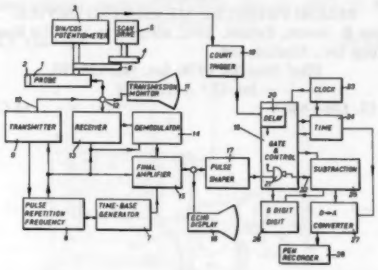
a multiplier circuit having a first input operatively connected to said first voltage producing means and a second input operatively connected to said second voltage producing means and an output at which there is produced a product voltage having a magnitude proportional to the product of the magnitudes of the first and second voltages.

4,290,432

DECOMPRESSION BUBBLE DETECTORS

Stephen Daniels, Oxford, England, assignor to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 10, 1979, Ser. No. 83,439
Claims priority, application United Kingdom, Oct. 11, 1978, 40103/78
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **12 Claims**



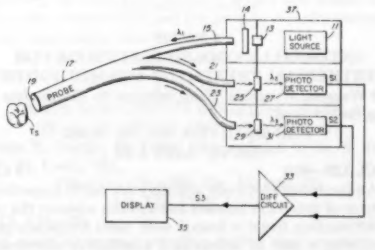
1. A decompression bubble detector for detecting decompression bubbles in human tissue comprising a pulsed ultrasonic transmitter, means to scan the transmitter across an area of tissue, a detector to record echoes reflected from said scanned area of tissue, a counter to count the number of echoes recorded by said detector in consecutive preselected time intervals, means for subtracting from said recorded number of echoes a number substantially equal to the average number of echoes recorded at normal atmospheric pressure, and a display means for displaying the resultant difference numbers of echoes recorded in successive preselected time intervals.

4,290,433

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF CARIES IN TEETH USING VISIBLE LUMINESCENCE

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463

Filed Aug. 20, 1979, Ser. No. 67,771
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—665 **28 Claims**



13. Apparatus for use in detecting the presence of caries in the teeth of a person comprising:

(a) means for illuminating a region to be examined with a beam of monochromatic light, the wavelength of the beam of monochromatic light being one which will produce emission from the region at a wavelength where the intensity is about the same for caries and non caries and at a wavelength where the intensity increases in the presence of caries,

(b) means for measuring the intensity of the light emitted

from said region on illumination by said illuminating means at a wavelength where the relative intensity dependence of the spectra is about the same for caries and noncaries and at a wavelength where the intensity increases in the presence of caries and producing an electrical signal whose output corresponds to the intensity at each wavelength,

(c) means producing an electrical signal corresponding to the difference in said two electrical signals, and

(d) means for displaying said difference electrical signal.

4,290,434

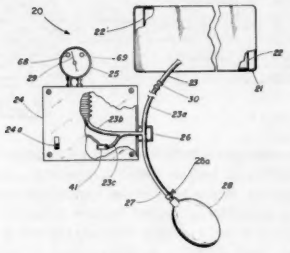
BLOOD PRESSURE MEASURING DEVICE

Warren R. Jewett, Tucson, Ariz., assignor to Vita Vet Research Group Inc., Marion, Ind.

Filed May 15, 1978, Ser. No. 905,795

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—680 **14 Claims**



1. A blood pressure measuring device for identifying the pressure of a subject's blood at systolic and diastolic conditions, said blood pressure measuring device comprising:

display means for indicating blood pressure measurements, sad display means including pressure sensor means and piezoelectric sensor means;

a compression cuff;

a quick disconnect bleed valve having a first end arranged with tube connection means and an opposite second end arranged with tube connection means;

a first section of tubing in fluid communication between said first end of said bleed valve and said compression cuff; and

a second section of tubing in fluid communication between said second end of said bleed valve and both said pressure sensor means and said piezoelectric sensor means.

4,290,435

INTERNALLY COOLED ELECTRODE FOR HYPERTHERMAL TREATMENT AND METHOD OF USE

David Waggott, Woodside, Calif., assignor to Thermatime A.G., Zug, Switzerland

Filed Sep. 7, 1979, Ser. No. 74,400

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—800 **8 Claims**

1. An improved electrode assembly for use in hyperthermal treatment of tumors in humans and animals wherein the tumor and surrounding tissue is heated with radio frequency energy by applying a pair of uninsulated conductive electrodes on opposite sides of a portion of the body containing the tumor such that an electrically conductive connection is made between the electrodes and the body portion to which they are applied, a radio frequency electric alternating current being passed between the electrodes at a magnitude selected to cause heating of the tumor beyond a predetermined temperature level while minimizing heating of tissue surrounding the tumor, said improved electrode assembly comprising an uninsulated conductive plate adapted for electrically conductive engagement with a surface portion of the body including the tumor for passing an electric current through both the tumor and surrounding tissue, means for interconnecting said conductive plate with circuit means for producing said radio frequency energy, means forming passages in heat exchange communication with said conductive plate, means for circulating a fluid coolant through said passages in order to limit temperature rise within surface portions of the body beneath said conductive plate, means forming a chamber including

outlet jets arranged adjacent the periphery of the conductive plate and directed outwardly of the periphery so as to be toward the surrounding surface portions of the body, and means connected with the chamber for supplying cooling fluid under pressure thereinto, whereby heating in surface portions of the body immediately surrounding the conductive plate is minimized during the hyperthermal treatment.

4,290,436

METHOD AND APPARATUS FOR PRODUCING AN ELONGATED FILLER FROM FIBERS, ESPECIALLY TOBACCO FIBERS

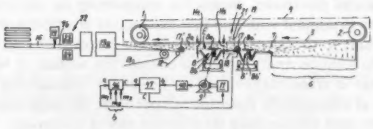
Joachim Reuland, Neu Börnsen, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 27, 1979, Ser. No. 61,283

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833085

Int. Cl.³ A24C *5/14, 5/39*

U.S. Cl. 131—108 **38 Claims**



1. A method of producing an elongated filler from fibers, especially tobacco fibers, comprising the steps of continuously converting the fibers into an elongated stream which contains a surplus of fibers and advancing the stream lengthwise; equalizing the advancing stream, including removing the surplus of fibers therefrom; densifying and wrapping the equalized stream to convert the stream into the filler; generating a signal in dependence on the height of the stream prior to said equalizing step; and controlling said equalizing step in dependence on said signal.

4,290,437

CHANGE-A-BOWL PIPE

Robert L. Smith, Rte. 1, Box 412, Burgaw, N.C. 28425

Filed Oct. 22, 1979, Ser. No. 87,046

Int. Cl.³ A24F *1/22*

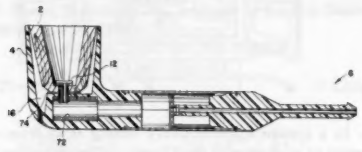
U.S. Cl. 131—196 **6 Claims**

1. A smoking pipe comprising:

(a) an outer bowl and an inner bowl;

(b) said inner bowl mounted within said outer bowl;

(c) said inner bowl having a bottom and an opening in said bottom;
(d) a stem including a mouthpiece and a bowl base support having a passageway therethrough;
(e) said passageway having an upper wall and having an opening in said upper wall;
(f) a hollow connector positioned in said openings and securing said inner bowl to said bowl base support and providing a passageway from said inner bowl to said stem passageway;
(g) said hollow connector positioning said inner bowl with regard to said outer bowl;
(h) said inner and outer bowls each having an upper rim and inner and outer surfaces;
(i) said inner and outer bowls at their upper rims including



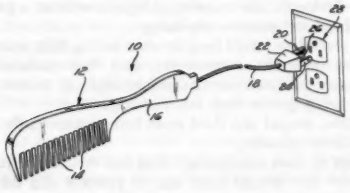
spacing means for maintaining said bowls in spaced relationship with one another;
(j) said outer bowl having its inner surface substantially vertical throughout its height;
(k) said inner bowl having a truncated cone shape and having its inner and outer surfaces tapering inwardly and downwardly toward said inner bowl bottom;
(l) said outer bowl having its depth exceeding the depth of said inner bowl;
(m) said inner and outer bowls having between them a concentric air space which substantially and continuously increases from said rims downwardly to at least the bottom of said inner bowl; and,
(n) said outer bowl including a base, and openings in said base to said air space for bringing cool air from outside said outer bowl into said air space.

4,290,438

STATIC ELECTRICITY GROUNDING COMB

Garey W. Price, 4817 Corwin La., Riverside, Calif. 92503

Filed Mar. 18, 1980, Ser. No. 131,475
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—11 R **2 Claims**



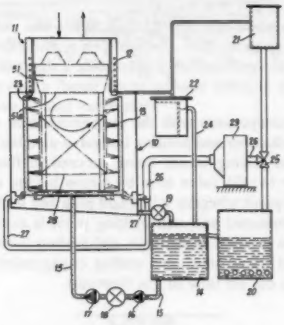
1. An electrically grounding comb for hair comprising:
a comb body, said comb body being electrically conductive, said comb body including a handle section; and
an electrical conductor having an inner end and an outer end, said inner end being embedded within said handle section and adapted to conduct static electricity from said comb body, said outer end comprising a plug, said plug having a grounding connector and a pair of securing connectors, said electrical conductor being electrically connected with said electrical grounding connector, said securing connectors being non-electrically conductive, whereby said securing connectors are to connect with mating openings within a conventional wall socket and simultaneously said grounding connector connects with a mating electrical grounding opening and static electricity is conducted from hair being combed through the comb and through said electrical conductor and is discharged through said electrical grounding connector.

4,290,439

DEVICE FOR CLEANING MECHANICAL PARTS

Jean Charpentier, Massy, France, assignor to Sietam S.A., Viry-Chatillon, France

Division of Ser. No. 970,962, Dec. 19, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 87,037
Claims priority, application France, Dec. 22, 1977, 77 38861
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—107 **11 Claims**



1. A cleaning unit for cleaning mechanical parts, assemblies and sub-assemblies thereof with a volatile solvent, said unit comprising:
(a) a vertically moveable holder for said parts;
(b) a lower unit portion including means for washing said parts;
(c) an upper unit portion including means for drying said parts by cooling;
(d) a unit portion including means for rinsing said parts by supplying superheated vapor into a base of said unit portion including means for rinsing; and
(e) a cover on top of said vertically moveable holder such that when said holder is temporarily immobilized in either said lower unit portion or said unit portion including means for rinsing, said cover partly closes a passage extending between said portion in which said holder is temporarily immobilized and the portion directly thereabove in a non-sealing relationship.

4,290,440

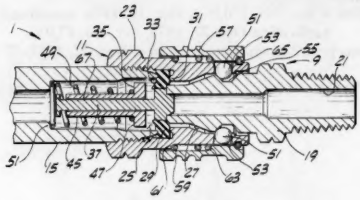
QUICK DISCONNECT COUPLING WITH A HEAT-SENSITIVE CUTOFF FEATURE

Malcolm B. Sturgis, St. Louis, Mo., assignor to M. B. Sturgis, Inc., St. Louis, Mo.

Filed Sep. 11, 1980, Ser. No. 186,175
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—75 **14 Claims**

1. A quick-disconnect coupling with a heat-sensitive cutoff feature for use in connecting a fuel source, such as a tank of pressurized gas, with a gas appliance, such as an outdoor gas grill, comprising interengageable plug and socket components, the latter component having a passage therethrough with inlet and outlet ends, the outlet end forming a chamber for receiving said plug component, a valve seat in the passage, a valve member in the passage comprising a valve stem and sealing means on the valve stem engageable with said valve seat, said valve member being movable in the passage between a closed position in which said sealing means is in sealing engagement with said valve seat to block flow therepast, and an open position in

which said sealing means is spaced away from the valve seat to permit flow through the passage, spring means engageable with said sealing means for biasing said valve member toward its closed position, said plug component being adapted, on insertion into said socket chamber, to engage said valve stem for moving the valve member against the bias of said spring means from its closed to its open position for flow of gas past the valve seat, and means for detachably connecting the plug



and socket components with the plug component received in said socket chamber and holding the valve member in its open position, said sealing means being secured in fixed position with respect to said valve stem by means having a relatively low melting point whereby when said plug and socket components are connected and said melting point is exceeded, said spring means is adapted to move said sealing means with respect to said valve stem into sealing engagement with said valve seat to cut off flow of gas therepast.

4,290,441

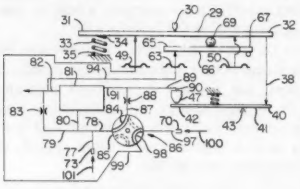
CONTROL DEVICE AND METHOD OF MAKING THE SAME

Douglas R. Scott, and Larry V. Price, both of Knoxville, Tenn., assignors to RobertShaw Controls Company, Richmond, Va.

Filed May 17, 1979, Ser. No. 39,792

Int. Cl.[3] G05D *16/00*; F15B *5/00*

U.S. Cl. 137—84 **8 Claims**



1. In a control device having a housing means provided with a main lever pivotally mounted thereto by a pivot means and being operatively associated with a flapper to move the same relative to a leakport means in relation to pivotal movement of said main lever caused by the movement of one or more main diaphragms operatively associated with said main lever, said device having a feedback diaphragm operatively associated with a feedback lever that is pivotally mounted to said housing means and operatively associated with said main lever to cause pivoting thereof upon pivoting movement of said feedback lever by said feedback diaphragm, said housing means having a plurality of inlet means respectively leading by fluid flow paths in said housing means to said diaphragms, the improvement comprising a diverter valve means carried by said housing means for selectively diverting the fluid path from one of said inlets that normally leads to one of said diaphragms to said leakport means whereby said control device can act as a control to the branch signal from another control unit that is to be interconnected to another of said inlets.

4,290,442

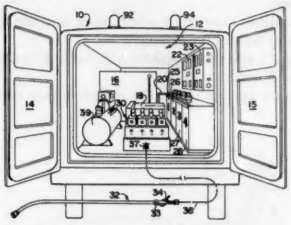
MOBILE CLEANING UNIT

Detmer B. Shaffer, Garrettsville, Ohio, assignor to Sparkle Wash, Inc., Chagrin Falls, Ohio

Division of Ser. No. 882,167, Mar. 1, 1978, Pat. No. 4,213,796. This application Mar. 24, 1980, Ser. No. 133,000

Int. Cl.[3] B08B *3/02*

U.S. Cl. 137—112 **2 Claims**



1. In a system for selectively mixing fluid from one of a plurality of sources with fluid from a different source, a plurality of electrically-operated valves, a fluid conduit from each of said plurality of sources to a different one of said valves, a conduit common to and interconnecting said valves and connected to a conduit that carries a flow of fluid from said different source, means forming a part of each of said valves for individually adjusting the effective size of the fluid conduits from said plurality of sources to the common conduit, means for selectively applying electrical signals to said valves, including a first switch that sequentially directs electrical energy to a different one of said valves each time the switch receives an electrical signal, to select the source from said plurality from which fluid is to be supplied and mixed with fluid from said different source, and a flow-actuated switch sensitive to flow of fluid from said different source for applying an electrical signal to said first switch each time flow of fluid is initiated for said different source.

4,290,443

FLEXIBLE TUBE LIQUID TRANSFER DEVICE

Gualtiero Crozzoli, Via di Vermicino, 184, Rome, Italy

Filed Jan. 25, 1979, Ser. No. 6,514

Claims priority, application Italy, Jan. 25, 1978, 47773 A/78

Int. Cl.[3] F04F *10/00*

U.S. Cl. 137—147 **5 Claims**

1. A device for the transfer of liquids without a pump by simple hand movement comprising:

first, second and third flexible tubes having first, second and third diameters respectively, said first diameter being greater than said second diameter and said second diameter being greater than said third diameter,

said first, second and third tubes being substantially coaxial with one another,

a coupling bush connecting a first end of said first tube and a first end of said third tube to position said third tube substantially coaxially within said first tube, said first and third tube defining an annular chamber therebetween,

said second tube being positioned between said first tube and said third tube for axial movement between a telescoped position and an extended position,

a sealing member at the second end of said first tube to provide a sealing engagement between said second end of said first tube and said second tube in all axial positions of said second tube,

said second tube when in the telescoped position having a first end adjacent said coupling bush and a second end extending past said sealing member, and

a removable air tight closure at the second end of said second tube,

the end of said device adjacent said coupling bush being open solely to the interior of said third tube,

the end of said device adjacent to said sealing member being closed by the joint action of said sealing member and said closure,

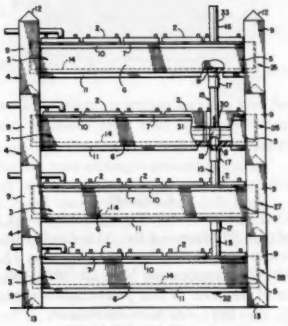
whereby manual extension of said second tube after placing the first end of the device in a liquid medium will draw liquid into the third tube and permit siphoning of the fluid to occur upon flexing the device and upon manual removal of the closure after full extension of the second tube.

4,290,444

FLOW CONTROL DEVICE FOR USE WITH A BATTERY FORMATION TUB

William G. Bevan, Birdsboro, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Jun. 19, 1980, Ser. No. 160,936
Int. Cl.³ F17D *1/00*
U.S. Cl. 137—255 **17 Claims**



1. A flow control device adapted for use in conjunction with a storage battery formation tub to control fluid flow between the interior and drain of the formation tub, the flow control device comprising:

(a) a longitudinally extending, hollow cylindrical member having a first end adapted to engage the drain of the formation tub, and having at least one aperture extending through the cylindrical member, to the interior of the cylindrical member; and

(b) a first sleeve movable along portions of the cylindrical member and having drainage means associated therewith, the first sleeve being movable between a first and second mode so that

(i) the first sleeve covers at least selected portions of the aperture to regulate fluid communication through the cylindrical member in the first, fluid regulating mode, and

(ii) the first sleeve extends beyond the first end of the cylindrical member to permit fluid to exit through the drainage means in the second, fluid drainage mode.

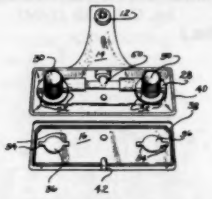
4,290,445

VALVE PLATE

Larry G. Turner, Waterford, Mich., assignor to Bristol Corporation, Elkhart, Ind.

Filed Aug. 31, 1979, Ser. No. 71,566
Int. Cl.³ F16K *11/20*
U.S. Cl. 137—359 **1 Claim**

1. In combination a valve plate, a basin having a first and second opening, a spout, first and second valve means for regulating the flow of liquid through said spout, each valve means including a threaded protrusion defining a liquid conduit into the valve means, each valve means protrusion carrying a mounting flange and extending through a said basin opening, nut means turned on each valve means protrusion for drawing the valve means into securement with said basin, said valve plate carried upon said basin about said basin openings, the improvement wherein each mounting flange carries a



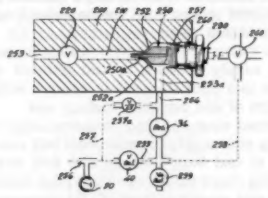
depending rib, said valve plate having first and second openings each with a slot in its periphery, each valve means protrusion fitting through a said valve plate opening with said slot therein receiving a flange rib to prevent rotation of the valve means relative to said valve plate.

4,290,446

PUMP/EXCHANGER DEVICE

Alfred J. Seiler, 1700 Dumas-Vemont, Ville de Laval, Quebec, Canada

Filed Jun. 22, 1979, Ser. No. 51,127
Claims priority, application Canada, Apr. 20, 1979, 326042
Int. Cl.³ F04F *5/24*
U.S. Cl. 137—557 **6 Claims**



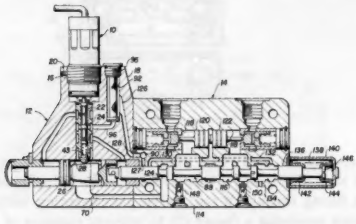
1. A combined pump/exchanger device comprising means defining an elongated passage having first and second ends, a port extending from said passage adjacent to but spaced from said first end, means within said passage at said first end for introducing a jet of compressed air into said passage axially of said passage at a point adjacent to but downstream of said port, said jet being of a cross section less than the cross section of said port, a valve in said passage intermediate said point and said second end, said second end being open, and an operating line connected to said port for coupling said device to an operating area, and said valve comprising means for selectively closing said passage and directing air under pressure to said operating line or opening said passage to said second end and creating a vacuum within said port and said operating line and causing an ingress of air, a regulator between said port and said operating line for controlling the pressure of the air discharged from said port into said operating line, a pressure-vacuum gauge coupled to said port for measuring either the pressure or vacuum condition in said port and a safety relief valve coupled to said port to ensure the air pressure in said port does not exceed a selected air pressure.

4,290,447

ELECTROHYDRAULIC PROPORTIONAL VALVE

Dale Knutson, Pewaukee, Wis., assignor to Dynex/Rivett Inc., Pewaukee, Wis.

Filed Oct. 5, 1979, Ser. No. 82,270
Int. Cl.[3] F15B *13/043*
U.S. Cl. 137—596.2 8 Claims



1. An electrohydraulic proportional valve comprising:

(a) a pilot actuator assembly comprising a pilot spool slidably received in a pilot sleeve and a feedback spool having a camming surface against which said pilot sleeve rides, said camming surface comprising a first portion in which the position of said pilot sleeve is a function of the axial position of said camming surface and a second portion immediately adjacent said first portion in which the position of said pilot sleeve is constant regardless of the axial position of said camming surface;

(b) an electromagnetic force motor assembly having an output member which is operatively connected to said pilot actuator assembly such that motion of said output member results in corresponding motion of said pilot spool; and

(c) a main spool and body assembly comprising:

(i) a main spool which is operatively connected to said pilot actuator assembly such that motion of said feedback spool results in corresponding motion of said main spool, said main spool having a reduced diameter area;

(ii) first and second load holding check valves slidably disposed in a bore;

(iii) first means of fluid communication for communicating pilot supply pressure to said reduced diameter area when said pilot sleeve is in contact with said second portion of said camming surface; and

(iv) second means of fluid communication for communicating pilot supply pressure from said reduced diameter area to said bore between said first and second load holding check valves when said pilot sleeve is in contact with said second portion of said camming surface.

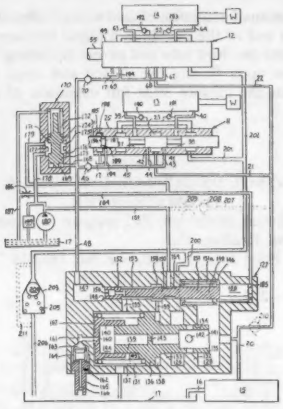
4,290,448

LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation of Ser. No. 960,767, Nov. 15, 1978, Pat. No. 4,209,039, which is a continuation-in-part of Ser. No. 947,626, Oct. 2, 1978, abandoned. This application May 24, 1979, Ser. No. 42,211
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.[3] F15B *13/08*
U.S. Cl. 137—596.13 10 Claims

1. A valve assembly comprising at least one housing having an inlet chamber connected to a pump, a load chamber, exhaust means communicable with reservoir means, a source of pressure fluid other than said pump, first valve means for selectively interconnecting said load chamber with said inlet chamber and said exhaust means, load sensing port means selectively communicable with said load chamber by said first valve means, bypass valve means between said inlet chamber and said exhaust means, pilot valve means having means responsive to pressure differential between pressure in said inlet chamber and pressure in said load sensing port means and means supplied by said source of pressure fluid operable to control said bypass valve means to vary bypass flow between said inlet



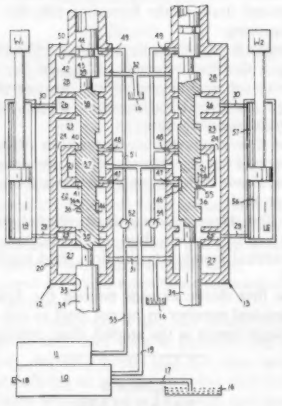
chamber and said exhaust means to maintain a constant pressure differential between said inlet chamber and said load sensing port means.

4,290,449

LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 960,072, Nov. 13, 1978, Pat. No. 4,200,118. This application Nov. 23, 1979, Ser. No. 96,803
The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.
Int. Cl.[3] F15B *13/08*
U.S. Cl. 137—596.13 6 Claims



1. A load responsive valve assembly comprising at least one valve housing having an inlet chamber, first and second load chambers, at least one exhaust chamber, and load sensing port means operable through signal conducting passage means to transmit a control load pressure signal to output flow control means of a pump, direction control means for selectively interconnecting and isolating said chambers and said load sensing port means in a number of control positions including a neutral position and a regeneration position, in said regeneration position said direction control means having means for intercon-

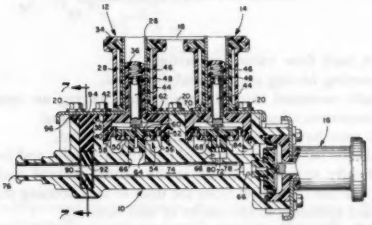
necting said first and second load chambers, means for interconnecting said first and second load chambers with said load sensing port means, means for interconnecting said first and second load chambers with said inlet chamber through variable metering orifice means and means operable to vary flow area of said variable metering orifice means.

4,290,450

FLUID MIXING VALVE

Wesley S. Swanson, Elk Grove Village, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 28, 1979, Ser. No. 24,751
Int. Cl.[3] F16K *19/00*
U.S. Cl. 137—606 **4 Claims**



1. A fluid mixing valve connectable to a plurality of pressurized fluid sources, said mixing valve comprising:

(a) housing means, said housing means including an integrally formed, one piece member defining,

(i) a primary fluid passageway,

(ii) a first fluid inlet in fluid communication with said primary passageway,

(iii) a second fluid inlet in fluid communication with said primary passageway,

(iv) a first flow restricting orifice in the path of fluid flow through said first inlet,

(v) a second flow restricting orifice in the path of fluid flow through said second inlet,

(vi) a linking passageway in fluid communication with said second fluid inlet and said primary passageway, said linking passageway in fluid communication with said second inlet at a location upstream from said second flow restricting orifice, said linking passageway having a portion axially aligned with said primary passageway,

(vii) a third flow restricting orifice in the path of fluid flow through said linking passageway; and

(b) valve means operably connected to said housing means at a location fluidly in common with each of said first inlet, said second inlet at a location downstream from said point of communication of said linking passageway and said linking passageway, for individually valving fluid flowing therepast to said primary passageway, each of said valve means being selectively actuable for varying the composition of flow to said primary fluid passageway, thereby varying the properties of flow through said outlet orifice.

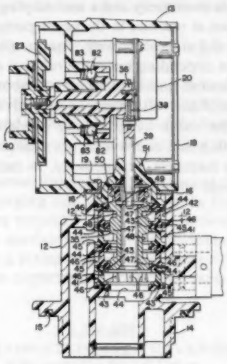
4,290,451

WATER CONDITIONING SYSTEM CONTROLS

Andrew Fleckenstein, Brookfield, and Michael Mortl, Glendale, both of Wis., assignors to L. W. Fleckenstein, Inc., Brookfield, Wis.

Filed Oct. 30, 1979, Ser. No. 89,450
Int. Cl.[3] F16K *11/07, 11/10*
U.S. Cl. 137—624.15 **3 Claims**

1. In a water conditioning system having a timer control and an associated softener valve operatively associated with a treatment tank and a brine tank with piping connections for water supply and brine injection and soft water distribution, the improvement comprising a rigidly mounted motor driving a piston and a timer control, a skipper wheel in the timer control, an operating connection between the driving motor and the skipper wheel for initiating operation of the conditioning system, said softener having a unitary brine valve module incorporating an injector and a brine valve, a plurality of



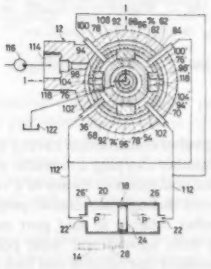
spacer rings provided in the softener valve and said piston operating in said rings, said spacer rings each made of a plastic material in two parts comprising vertically spaced upper and lower elements separated by a plurality of pins integral with one such element and heat bonded to the other element, and seal rings between the adjacent spacer rings.

4,290,452

ROTARY-MOTION VALVE AND POWER-ASSISTED STEERING SYSTEM INCORPORATING THE VALVE

Koichi Takahashi, Yokohama, and Megumu Higuchi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 25, 1979, Ser. No. 60,792
Claims priority, application Japan, Aug. 7, 1978, 53-95905
Int. Cl.[3] F15B *9/10*; F16K *11/06*
U.S. Cl. 137—625.23 **33 Claims**



1. A rotary-motion directional fluid-flow control valve comprising, in combination, a generally cylindrical valve element rotatable about an axis therethrough and having formed in its outer peripheral wall at least two concavities arranged in predetermined angular relationship to each other about said axis, a generally cylindrical valve body rotatable about an axis substantially in line with the axis of rotation of the valve element and circumferentially slidable on the outer peripheral surface of the valve element, the valve body having a circumferential groove formed in the inner peripheral wall thereof and circumferentially extending over said concavities and at least two radial holes arranged in predetermined angular relationship to each other about the axis of rotation of the valve

body, and at least two plug members closely fitting in said radial holes, respectively, and projecting into said circumferential groove for dividing the circumferential groove into arcuate groove portions separate from each other across the plug members, the plug members including a first plug member which is solid in its entirety and a second plug member formed with a bore open at one end to the outer peripheral wall of the valve element and at least partially communicable with one of said concavities depending upon the relative angular positions of the valve element and the valve body about the respective axes of rotation of the valve element and valve body, the valve element and the valve body having predetermined angular positions in which said concavities are substantially in registry with said plug members, respectively, in radial directions of the valve element and the valve body.

4,290,453

REVERSING VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

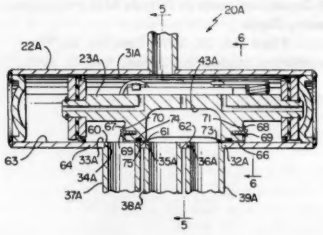
Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 960,969, Nov. 15, 1978, Pat. No. 4,212,324, which is a division of Ser. No. 825,957, Aug. 19, 1977, Pat. No. 4,144,905. This application May 31, 1979, Ser. No. 44,179

The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.

Int. Cl.³ F16K *11/07, 31/363*

U.S. Cl. 137—625.43 **2 Claims**



1. In a reversing valve construction having a housing means provided with a chamber carrying a movable piston-like valve member therein that controls port means of a valve seat means of said housing means through the relative position of a cavity of said valve member relative to said port means, said port means comprising first, second and third ports disposed in spaced apart and straight line relation and said cavity bridging said first and second ports while exposing said chamber to said third port when said valve member is in one position thereof and bridging said second and third ports while exposing said chamber to said first port when said valve member is in another position thereof, the improvement comprising a relatively thin and flexible sealing member secured to said valve member and disposed between said valve member and said valve seat means and surrounding said cavity to seal said cavity to said valve seat means while permitting sliding movement therebetween, said flexible sealing member including a relatively thin tape of polytetrafluoroethylene material on the side thereof that faces said valve seat means and a thin metallic shim-like member having said tape of polytetrafluoroethylene material secured to one side thereof.

4,290,454

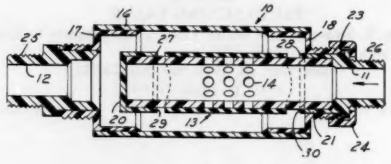
BACK FLOW VALVE

Earl B. Shetler, 9508 Tuscola Rd., Clio, Mich. 48420

Filed Jun. 30, 1980, Ser. No. 164,813

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—853 **13 Claims**



1. A back flow valve comprising

a housing having an inlet and an outlet,

a tube mounted in said housing and having an open end communicating with the inlet to said housing,

said tube having the other end thereof closed,

said tube having a plurality of circumferentially and longitudinally spaced openings at the center thereof such that fluid can only flow from the inlet to said housing through said openings to the outlet of said housing,

an elastic sleeve telescoped over said tube and normally closing said openings,

the inside diameter of said sleeve being less than the outer diameter of said tube,

said tube having longitudinally spaced abutments adjacent the ends of said sleeve,

the length of said sleeve being less than the longitudinal distance between said abutments,

the ends of said sleeve having portions thereof extending axially beyond other portions thereof such that as fluid pressure is built up, the sleeve stretches and liquid flows out of said openings in said tube and along the exterior of said tube and the liquid engages said abutments and in cooperation with said longitudinally extending portions causes said sleeve to rotate facilitating the opening and closing of said sleeve even after prolonged periods of time and preventing foreign matter from remaining between said sleeve and said tube.

4,290,455

REED VALVE

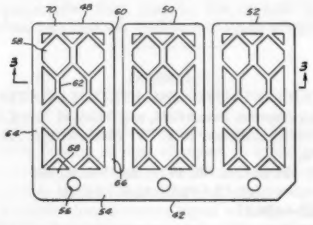
Shoichi Honda, Tokyo, and Nobuyoshi Watanabe, Omiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1979, Ser. No. 49,734

Claims priority, application Japan, Jun. 28, 1978, 53-78278

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—855 **17 Claims**



1. A reed valve comprising a reed element having a first surface, said first surface including cavities therein, said cavities being discontinuous, one from another, and structurally independent, and a planar peripheral boundary and frame

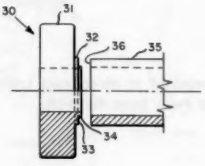
members extending between said discontinuous cavities, said boundary and said frame members having surface continuity there among, said cavities extending into said element to define membranes between said frame members.

4,290,456

THERMOPLASTIC PIPE STUB END

Harold Ahrbeck, Kingston, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 13, 1977, Ser. No. 815,085
Claims priority, application Canada, Aug. 16, 1976, 259142
Int. Cl.³ F16L *47/02*
U.S. Cl. 138—109 **7 Claims**



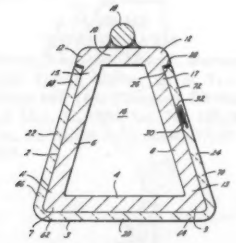
1. An improved thermoplastic pipe stub end having a flange portion integrally joined to a neck portion, the neck portion having inner and outer surfaces and terminating at a welding face, the improvement comprising the neck portion extending from the flange a length in millimeters of not greater than $1.5\sqrt{O.D.}$, where O.D. is the outer diameter in centimeters of the neck portion at the welding face.

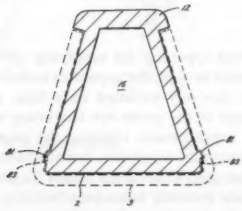
4,290,457

TRUNCATED TRIANGULAR INSULATOR

Frank Campbell, Jr., 2274 Broadlawn, Houston, Tex. 77058

Filed Nov. 2, 1979, Ser. No. 90,814
Int. Cl.³ F16L *9/10, 9/22*; F27B *9/14*; F27D *3/02*
U.S. Cl. 138—149 **20 Claims**





1. An insulator for use in combination with a truncated triangular structural member including a base member having first and second ends, converging first and second side members having upper and lower ends, the lower ends of the first and second side members secured to the first and second ends of the base member respectively, the upper ends of the side members spaced apart and secured to an apex member and a pair of shoulders extending outwardly from each upper end of said side member in proximity to where the side members are secured to the apex member, each shoulder including a lower lip, the insulator comprising:

(a) a substantially straight base unit having first and second ends;

(b) first and second converging side walls having upper and lower ends, said first and second lower ends secured to the first and second ends respectively of the base unit and said upper ends in spaced apart relationship to one another; and

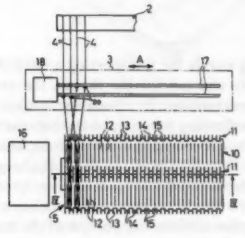
(c) a support means formed by the abutment of the first and second converging side walls against the first and second side members respectively of the structural member for securing the insulator around the periphery of the base member and a substantial portion of the first and second side members respectively of the structural member.

4,290,458

MULTIPLE LONGITUDINAL TRAVERSING SHED WEAVING APPARATUS

Alois Steiner, Rieden, Switzerland, assignor to Rüti Machinery Works Ltd., Zurich, Switzerland

Filed Nov. 23, 1979, Ser. No. 96,776
Claims priority, application Switzerland, Dec. 7, 1978, 12511/78
Int. Cl.³ D03C *13/00*
U.S. Cl. 139—28 **19 Claims**



1. A multiple longitudinal traversing shed weaving loom comprising:

a rotatable weaving rotor over which pass warp threads moving in a predetermined direction of travel;

beat-up elements provided for the weaving rotor for bearing weft threads inserted through the warp threads;

shed-retaining elements for holding the warp threads over a predetermined path in selective upper and lower shed positions;

said beat-up elements being spaced from one another to form between each two neighboring beat-up elements an intermediate space;

a respective one of said shed-retaining elements for determining the upper shed position or lower shed position being operatively associated with each intermediate space between neighboring beat-up elements;

control means arranged forwardly of the weaving rotor with respect to the direction of travel of the warp threads;

said control means serving for the lateral deflection and random correlation of each warp thread to a shed-retaining element which determines the upper shed position or lower shed position;

a respective guide element for the warp threads arranged at the weaving rotor between each two beat-up elements which follow one another in the direction of rotation of said weaving rotor; and

the guide elements being oriented such that the line of alignment thereof is located within the intermediate space between beat-up elements neighboring one another in the direction of weft insertion.

4,290,459

BLOWING NOZZLE FOR TRANSPORTING A FLEXIBLE THREAD

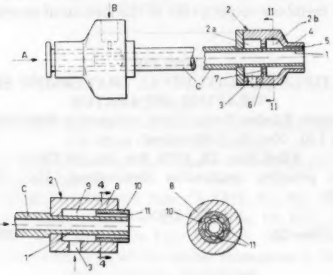
Petrus G. J. Manders, Eindhoven, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Aug. 17, 1979, Ser. No. 67,628

Claims priority, application Netherlands, Aug. 3, 1979, 7808180

Int. Cl.³ D03D *47/28*

U.S. Cl. 139—435 **4 Claims**



1. A blowing nozzle for transporting a flexible thread, comprising a supply channel for the thread, the exit end of said channel being surrounded by an annular orifice, a connection for supplying a flowing pressurized fluid to the upstream side of said orifice, and an elongated mixing tube which is arranged to receive the thread as well as fluid discharged from said orifice and which substantially forms an extension of said channel, wherein the improvement comprises a sleeve which surrounds only the outflow end portion of the mixing tube, the upstream end of the sleeve having a sealing engagement around the mixing tube, and the downstream end of the sleeve lying in substantially the same plane as the downstream end of the mixing tube, a sleeve-shaped filling piece which fills the space between the downstream end portion of the sleeve and the mixing tube and which contains axial exhaust channels and a connection for supplying a flowing pressurized fluid to the interior of the sleeve upstream of the filling piece.

4,290,460

ACTIVE AUXILIARY NOZZLE FOR A SHUTTLE-LESS LOOM WITH PNEUMATIC WEFT INSERTION

Albert H. Deborde, Bourgoin-Jailleu, France, assignor to Saurer-Diederichs, Bourgoin-Jailleu, France

Filed Feb. 23, 1979, Ser. No. 14,688

Claims priority, application France, Aug. 1, 1978, 78 23205

Int. Cl.³ D03D *47/30*

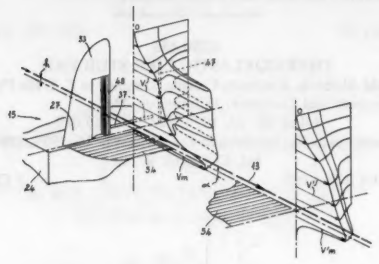
U.S. Cl. 139—435 **16 Claims**

1. An active auxiliary nozzle for a shuttle-less loom with pneumatic weft insertion, comprising:

a chamber connected to a compressed air supply source;

means defining a horizontal air outlet slot connected to said source; and

means defining at least one vertical air outlet slot to produce, downstream of the auxiliary nozzle, in a direction of weft displacement, a substantially horizontal lower flat jet and at least one lateral flat jet substantially parallel to a comb of the loom, the means defining said horizontal air outlet



slot being oriented to direct said lower flat jet slightly downwardly away from the weft.

4,290,461

YARN FEED CONTROLLING DEVICE

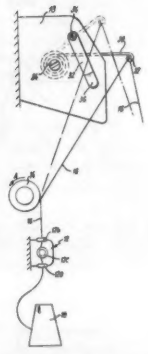
John D. Griffith, Boldon, England, assignor to Bonas Machine Company Limited, Sunderland, England

Filed Jan. 10, 1980, Ser. No. 111,083

Claims priority, application United Kingdom, Jan. 18, 1979, 01855/79

Int. Cl.³ D03D *47/34*

U.S. Cl. 139—450 **9 Claims**



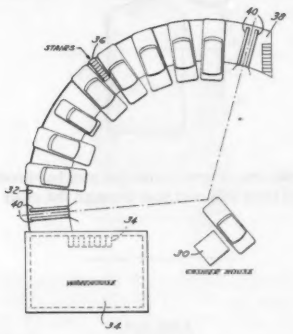
1. A yarn feed apparatus for supplying yarn intermittently under a consistent tension, the apparatus including a yarn guide eye resiliently movably mounted on a base, a clamp means located upstream of the guide eye and being operated by the guide eye for intermittently trapping the yarn to prevent its movement through the apparatus, continuously rotatable yarn feed means upstream of the clamp means for positively feeding yarn to the guide eye only when yarn between the feed means and clamp means is under tension, the yarn guide eye being arranged to render the clamp means inoperative while yarn is being pulled from the apparatus and arranged to render the clamp means operative to grip the yarn to prevent further supply of yarn from the apparatus when yarn downstream of the guide eye is relaxed by a predetermined amount.

4,290,462

LUBRICATING APPARATUS AND SYSTEM

Lawrence A. Schott, 15940 Warwick Rd., Detroit, Mich. 48223, and Roger A. Schott, 15060 Seminole, Redford, Mich. 48239

Filed Jul. 16, 1979, Ser. No. 58,117
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—98 **7 Claims**



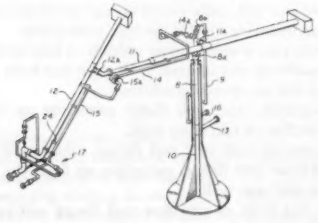
1. A system of servicing vehicles for oil change and lubrication and the like which comprises:
(a) one or more service stalls for an operator,
(b) a cashier's booth placed at vehicle level in lineal relation to the one or more stalls,
(c) a vehicle support track over the service stall to support a vehicle temporarily while being serviced, and
(d) said vehicle support tracks comprising:
(1) a pair of parallel tracks in spaced relation,
(2) means to support said tracks adjacent a service stall for movement transversely in relation to each other, and
(3) means responsive to contact with the front wheels of a vehicle to cause said track to move to register with the track width of a particular vehicle.

4,290,463

LOADING ARM

Bernard J. DeGeorge, Kingsland; Dean E. Hermanson, Richardson, and Carlos Tomas, Dallas, all of Tex., assignors to Youngstown Sheet and Tube Company, Pittsburgh, Pa.

Filed Mar. 11, 1980, Ser. No. 129,240
Int. Cl.³ B65B *3/18;* B65G *67/00*
U.S. Cl. 141—387 **10 Claims**



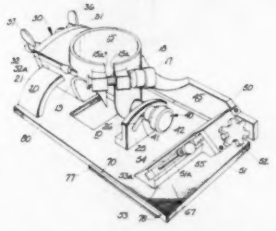
1. A loading arm comprising,
a support,
main and auxiliary riser pipes on said support,
inboard and outboard main and auxiliary arms carried by said support and connected to said riser pipes,
means maintaining said outboard arms in fixed relationship with each other,
a first pair of elbows spaced from each other and connected to said outboard arms,
a first pair of swivel joints spaced from each other and connected to said first pair of elbows and rotatable about a first axis,
a second pair of elbows spaced from each other and connected to said first pair of swivel joints,
a second pair of swivel joints spaced from each other and connected to said second pair of elbows and rotatable about a second axis perpendicular to said first axis,
a third pair of elbows spaced from each other and connected to said second pair of swivel joints,
a third pair of swivel joints spaced from each other and connected to said third pair of elbows and each rotatable about an axis perpendicular to both said first and second axes, and
a connecting means carried by each of said third pair of swivel joints.

4,290,464

HOLDER FOR PORTABLE ELECTRIC CUTTING INSTRUMENT

Mario Marsan, 560 Beechtree Dr., Cincinnati, Ohio 45224

Filed Mar. 20, 1980, Ser. No. 132,322
Int. Cl.³ B27C *5/10*
U.S. Cl. 144—136 C **10 Claims**



1. A holder for a portable electric router comprising a base plate having planar bottom surface, an orifice in said base plate adapted for passage of a cutting tool on said router therethrough, means positioned above said base plate for clamping said router in operative position, first and second angular adjustment means secured to a top surface of said base plate on each side of said clamping means, said clamping means being secured between said adjustment means and movable therewith in angular planes of adjustment, at least one of said adjustment means having an arcuate bearing surface of sufficient length to provide tilting of said clamping means, said router and its cutting tool at least 45° in two directions from a plane vertical to said base plate, means on each said adjustment means for rigidly securing said router and cutting tool at a desired angle of adjustment from said vertical plane in two directions, an elongted straight edge guide parallel to said angular planes of adjustmet and having a bottom surface coplanar with said planar bottom surface of said base plate, and means for moving said edge guide laterally relative to said angular planes of adjustment to a desired position of displacement parallel thereto.

4,290,465

HAND INSTRUMENT

Robert W. Fee; Richard E. TenEyck, both of Wichita, and Lloyd T. Smith, Newton, all of Kans., assignors to S/V Tool Company, Inc., Newton, Kans.

Filed Oct. 17, 1979, Ser. No. 85,815
Int. Cl.³ B25G *1/00*
U.S. Cl. 145—61 R **4 Claims**

1. In a hand instrument:
an elongated handle having a pair of opposed ends,
there being an elongated cavity in said handle disposed

longitudinally thereof and extending inwardly from one of said ends;

an elongated connector conforming in shape to the cavity,

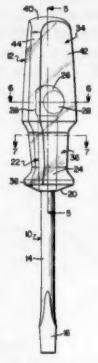
said connector being encased within and completely filling said cavity,

said handle tightly engaging the entire outer surface of the connector therearound to rigidly attach the connector to the handle,

said connector having an elongated, tubular stem,

said stem being provided with an innermost end having a solid, essentially spherical boss integral with the stem for holding the connector against inward movement relative to the handle toward the opposite end of the latter,

said boss having a plurality of outwardly facing, circular, flat surfaces, spaced equally therearound for holding the handle and the connector against relative rotation; and



an elongated, solid shank within the connector and extending outwardly therefrom beyond said one end of the handle,

said connector tightly engaging the entire outer surface of that portion of the shank disposed in the connector to rigidly attach the shank to the connector,

said shank having an innermost end extending into the boss for holding the shank against inward movement relative to the connector toward said opposite end of the handle,

said shank having a pair of elongated, diametrically opposed, radial ribs within the connector adjacent the boss and extending longitudinally of the shank for holding the shank and the connector against relative rotation,

the handle, the connector and the shank being coaxial.

4,290,466

CONVERTIBLE CONTAINER-HOLDER THAT BECOMES THE NECK OF A FOLDING RECEPTACLE

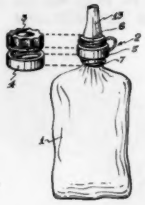
Oscar Villa, and Jorge A. Falcon, both of Rivadavia str. 4227, Buenos Aires, Argentina

Filed Nov. 15, 1979, Ser. No. 94,481

Int. Cl.³ B65D *33/00*

U.S. Cl. 150—1 **6 Claims**

1. A convertible assembly that is adapted to hold a folded flexible container and to effectively serve as the neck of said container when the latter is extracted and unfolded, comprising a rigid tubular member having opposite end portions formed with cap mounting means, closure caps removably mounted on said end portions, and an internal ring mounted within said tube, said tube being capable of enclosing a folded container having a reduced size neck at one end and which when unfolded can contain an appreciably larger volume of fluid material than said tube, and being so constructed and arranged that upon removal of said caps and extraction of the folded container the neck of the container may be inserted through one tube end and positively held in place on the tube



by said internal ring, whereby material may be introduced into and dispensed from said container through the other tube end.

4,290,467

RECLOSABLE FILM PLASTIC BAGS AND METHOD OF MAKING SAME

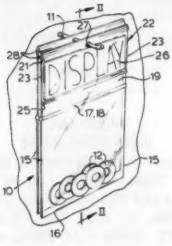
John Schmidt, Copenhagen, Denmark, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Oct. 24, 1979, Ser. No. 88,090

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910851

Int. Cl.³ B65D *27/20*

U.S. Cl. 150—3 **31 Claims**



1. A reclosable film plastic merchandise contents display bag having front and rear walls joined at least at closed sides and providing an openable top for the bag, comprising:

complementary separable fastener profiles on said walls across said openable top and adapted to be separated from a closed condition into an opened condition;

a fastener-opening front pull flange extending up from the fastener profile on said front wall;

a fastener-opening wall rear pull flange, substantially longer than said front pull flange, extending up from the fastener profile on said rear wall;

a panel on the front of said rear pull flange and providing therewith a plural thickness header for the bag;

said panel having its sides secured to said rear pull flange and a lower edge of said panel being separable relative to said front pull flange;

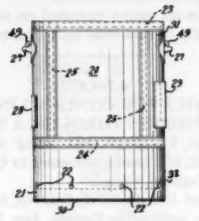
matching hang-up holes through said panel and said rear pull flange adjacent to the upper ends thereof;

and a header reinforcing rib structure above said holes securing the upper ends of said panel and said rear pull flange together and stiffening the header against sagging under the weight of package contents when the bag is hung on a hanger extending through said hang-up holes.

4,290,468
PORTABLE COLLAPSIBLE CONTAINER

Percy Rosenbloom, Jr., and Percy Rosenbloom, III, both of Jacksonville, Fla., assignors to Technical Materials, Inc., Jacksonville, Fla.

Filed Nov. 15, 1979, Ser. No. 94,441
Int. Cl.³ B65D *33/02*
U.S. Cl. 150—49 **20 Claims**

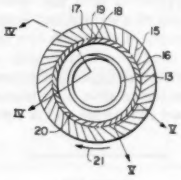


1. A collapsible and flexible container comprising a generally thin walled cylindrical body having an upper end and a lower end, said body being made of collapsible and flexible sheet material, a removably attachable bottom cover, and fastening means for removably attaching said cover to said lower end of said body, said cover having an outside surface of wear resistant, low friction material, said body enclosing in its wall adjacent said upper end a first circumferential stiff hoop and spaced intermediate of said upper and lower ends a second circumferential stiff hoop substantially parallel to said first hoop, said body also enclosing in its wall a plurality of spaced stiffening members substantially perpendicular to and separated from said hoops and positioned intermediate of said first and second hoops.

4,290,469
SELF-LOCKING NUT-TYPE OR BOLT-TYPE FASTENING DEVICE

Isoji Nakae, Wakayama, Japan, assignor to Kishu Neji Co., Ltd., Osaka, Japan

Filed Sep. 4, 1979, Ser. No. 72,047
Int. Cl.³ F16B *39/282*
U.S. Cl. 411—185 **6 Claims**

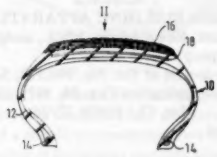


1. A fastening device comprising:
a body having a rotational axis, an engaging surface and threads concentric with said axis;
said engaging surface having formed therein and extending therefrom a plurality of ratchet-like projections having a sawtooth-type circumferential cross-section;
each said projection including a first radially outer edge and a second radially inner edge which together define a leading point which forms a most prominent portion of said projection;
all of said points being located on an imaginary circular line and facing in the direction of loosening of the fastening device;
each said first edge extending outwardly from said circular line in a direction inclined to the radial by a first angle;
each said second edge extending inwardly from said circular line in a direction inclined to the radial by a second angle different from said first angle; and
said circular line being positioned nearer the inner periphery of said engaging surface than the outer periphery thereof, whereby the cutting area of said first edges is larger than that of said second edges, and the length of each said first edge is greater than the length of each said second edge.

4,290,470
POROUS TIRE TREAD AND METHOD OF BONDING DISCRETE PARTICLES TO FORM SAME

Arthur R. Williams, Birmingham, and Gareth T. Williams, Lichfield, both of England, assignors to Dunlop Limited, London, England

Filed Mar. 6, 1980, Ser. No. 127,655
Claims priority, application United Kingdom, Mar. 16, 1979, 09376/79
Int. Cl.³ B60C *11/00*; B29G *7/02*
U.S. Cl. 152—209 R **27 Claims**

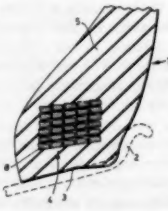


1. An unpatterned grooveless tire tread for a motor vehicle tire, wherein the tread comprises an assembly of numerous discrete particles of elastomeric material bonded together to form a cohesive nonsolid mass with adjacent particles bonded together only separated portions thereof, and intermediate said bonded portions, the particles being spaced-apart to provide passages which are randomly distributed and randomly oriented, said passages extending substantially throughout the tread, including from a highway-contacting surface of the tread, said passages constituting voids in the tread, the total void content of the tread being in the range from 10% to 60% of the overall volume of the tread, such that in use of a tire incorporating said tread, said passages provide for drainage of water away from the portion of tread surface contacting a wet highway.

4,290,471
BUILT-UP CORE FOR THE BEAD OF A PNEUMATIC TIRE FOR WHEEL RIMS WITH INCLINED SHOULDERS

Herbert Pfeiffer, Hemer, Fed. Rep. of Germany, assignor to Otto Kuhlmann GmbH & Co. KG, Hemer, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,657
Claims priority, application Japan, Jan. 10, 1979, 54-760
Int. Cl.³ B60C *15/04*
U.S. Cl. 152—362 R **2 Claims**



1. A ring-like built-up core of the shape in cross-section of a

parallelogram for the bead of a pneumatic tire for wheel rims with inclined shoulders, the radially-inward surface of the core being inclined in relation to the direction of the axis of the pneumatic tire so as to be parallel to the bead seat which core comprises lays of wire disposed side-by-side wound over one another upon a support conically shaped to conform to the inclination of the shoulder of the wheel rim and which lays are formed by individual wires trapezoidal in cross-sections so as to have narrower and broader ends, the narrower ends of all the wires of the built-up core being directed in the same direction towards the outside surface of the pneumatic tire bead such that the narrower ends of the wires of one lay of wire are supported on the broader ends of the wires of the next lay of wire so as to provide clearance spaces between the consecutive narrower and broader ends of the individual wires of each individual wire lay and clearance spaces between the opposite surfaces of the wires of each lay of wire and the corresponding wires of the next lay of wire.

4,290,472

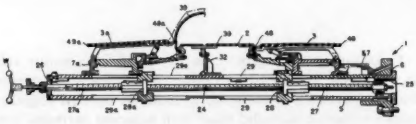
TIRE BUILDING APPARATUS

Emerson C. Bryant, Edwardsburg, Mich., assignor to National-Standard Company, Niles, Mich.

Continuation-in-part of Ser. No. 944,578, Sep. 21, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,876

Int. Cl.[3] B29H *17/16*

U.S. Cl. 156—416 **16 Claims**



1. A tire building apparatus for building a complete tire in a single operation, including in combination:

an elongated shaft,

an intermediate drum mounted on said shaft in surrounding relation thereto, said intermediate drum including a central supporting member and an elastic sleeve having an intermediate portion and two oppositely disposed end portions, with said elastic sleeve operable between a collapsed position, wherein said intermediate portion and said end portions are axially aligned with each other in position to form a substantially smooth walled cylindrical member, and an expanded position, wherein said end portions are disposed closer together than in said collapsed position and said intermediate portion is disposed radially outwardly of said collapsed position thereof,

two end drums disposed around said shaft on respective opposite sides of said intermediate drum, said end drums having outer peripheral surfaces extending axially, in the unactuated condition for use, in conjunction, with said central supporting member for complete support of the tire carcass components thereon and bead lock clamp means movable radially outwardly to clamp the tire carcass material to the tire beads, wherein in one position said outer peripheral surfaces are disposed in substantially axially aligned relation to the collapsed position of the outer peripheral surface of said intermediate drum sleeve to support the tire carcass material therearound,

carrier means mounted on said shaft and movable axially relative thereto and operatively connected to said end portions of said intermediate drum sleeve and said end drums, said carrier means being movable relative to said shaft for simultaneously moving said end portions of said intermediate drum sleeve inwardly toward each other along said shaft into said expanded position thereof and said end drums inwardly toward each other along said shaft into position to dispose said bead lock clamp means in position to support the beads in the position of the beads of a finished tire,

means for feeding air under pressure into said sleeve, simultaneously with said moving of said end portions inwardly toward each other, to thereby move said intermediate portion of said sleeve radially outwardly into said expanded position thereof and thereby correspondingly move the carcass material disposed thereon outwardly into said expanded position, and

carcass ply turn-up means mounted on said end drums axially outwardly of said bead lock clamping means.

4,290,473

APPARATUS FOR CONTROLLING LIGHT TRANSMISSION THROUGH A WINDOW

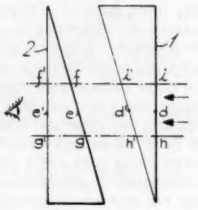
James G. Pierson, Longueuil, and David A. Wilmshurst, St. Catherines, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Jan. 24, 1979, Ser. No. 6,112

Claims priority, application Canada, Jan. 25, 1978, 295640

Int. Cl.[3] A47G *5/02;* **G02B** *5/22*

U.S. Cl. 160—120 **9 Claims**



1. A device for controlling transmission of light through a window comprising:

(a) two lineal strips of roller-mounted film material having light · transmission characteristics which vary linearly longitudinally from a maximum at one end to a minimum at the other end thereof, said strips being (i) disposed in overlying spaced parallel planar relationship over an area corresponding at least to the area of the window, (ii) extended beyond said area, and (iii) disposed so that said maximum transmission characteristic end of a first said strip is in juxtaposition with said minimum transmission characteristic end of a second said strip; and

(b) means for linearly moving one film strip relative to the other in said overlying relationship and in said area, whereby the amount of light transmission over said area is dependent upon the relative light transmission characteristics of said two film strips and is substantially uniform over said area.

4,290,474

METHOD AND APPARATUS FOR ELECTROSLAG CASTING OF METALS

Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109; Georgy A. Boiko, ulitsa Vladimiro-Lybedenskaya, 16, kv. 106; Rudolf S. Dubinsky, ulitsa Politekhnicheskaya, 5, kv. 209, and Sergei P. Egorov, ulitsa Nevskaya, 34, kv. 1, all of Kiev, U.S.S.R.

Filed Jun. 12, 1979, Ser. No. 47,944

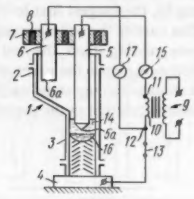
Int. Cl.[3] B22D *27/02*

U.S. Cl. 164—470 **9 Claims**

1. A method for producing castings having one end portion of a larger cross-section by electroslag casting of metals in a mould of a desired shape, mounted on a bottom plate, which method comprises the steps of: forming a portion of the casting, having a smaller cross-section, by melting at least one first consumable electrode connected to one terminal of an electric power source in series with said bottom plate connected to the other terminal of said electric power source, and forming a

portion of the casting, having a larger cross-section, by simultaneously melting at least one first consumable electrode and at least one second consumable electrode, said first and second electrodes being connected in series with said electric power source.

4. An apparatus for producing castings having one end portion of a larger cross-section, by electroslag casting of metals, comprising: a cooled mould, a bottom plate of said mould, an electric power source having two terminals, a



switch connecting said bottom plate to one of the terminals of said electric power source, at least one first consumable electrode with a melting end located at a first level relative to said bottom plate, said first consumable electrode being connected to the other terminal of said electric power source, at least one second consumable electrode with a melting end positioned at a second level relative to said bottom plate, said second consumable electrode being connected to the same terminal of said electric power source as said bottom plate, said second level being higher than said first level.

4,290,475

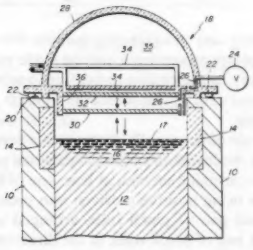
INGOT CASTING

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Continuation-in-part of Ser. No. 10,712, Feb. 9, 1979, Pat. No. 4,256,919. This application Dec. 20, 1979, Ser. No. 105,510

Int. Cl.³ B22D *7/10*

U.S. Cl. 164—513 **26 Claims**



1. A mold structure for casting metal ingots characterized by an upper surface shrinkage pipe of reduced size relative to ingots cast in an open-top mold, said mold structure comprising:

a mold body having a top opening; and

a mold cap for placement over said opening, said cap comprising:

a diaphragm of material having a melting point higher than the metal to be cast, said diaphragm having a bottom surface and a top surface, said bottom surface being disposed, when said mold cap is positioned on said mold body, to intercept radiation emitted from and to re-emit radiation toward the top surface of a liquid metal mass placed in said mold body; and

means for returning radiation emitted from the top surface of said diaphragm back thereto.

4,290,476

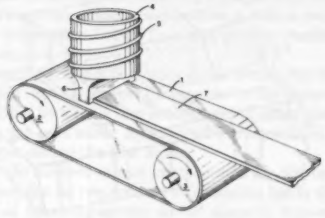
NOZZLE GEOMETRY FOR PLANAR FLOW CASTING OF METAL RIBBON

Robert W. Smith, Long Valley; Naim S. Hemmat, Mendham; John R. Bedell, Madison; Sheldon Kavesh, Whippany, and Seymour Draizen, Old Bridge, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 14, 1980, Ser. No. 112,006

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—423 **9 Claims**



1. An apparatus for planar flow casting of metal ribbon comprising a movable chill surface, a reservoir for holding molten metal and a nozzle in communication at its top with the reservoir and having at its bottom two lips adjacent to the chill surface, a first lip and a second lip numbered in the direction of movement of the chill surface, wherein

(a) the lips are separated by and define a slot for depositing molten metal on the chill surface;

(b) the leading and trailing edges of the slot are substantially parallel, to each other and are generally perpendicular to the direction of movement of the chill surface;

(c) the bottom of the lips comprises at least two now-coplanar surfaces, including a substantially planar first surface substantially parallel to the chill surface, said first surface including the leading edge of the first lip and the side edges at the bottom of the lips but not including the trailing edge of the slot;

(d) the first surface is separated from the chill surface by at least about 0.20 mm; and

(e) all points on the bottom of the lips are at least as far from the chill surface as is the first surface, but are no further from the chill surface than about 1 mm.

4,290,477

NOZZLE FOR STRIP CASTING

Ernst Huber, Schaffhausen; Wolfhart Rieger, Buch, and Martin Bolliger, Sierre, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 29, 1979, Ser. No. 7,446

Claims priority, application Switzerland, Jan. 30, 1978, 991/78

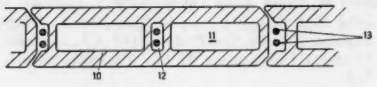
Int. Cl.³ B22D *11/06, 11/10*

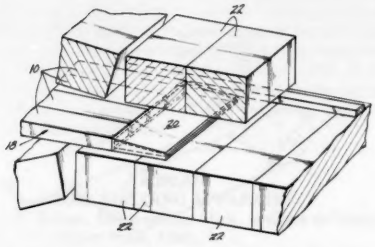
U.S. Cl. 164—430 **21 Claims**

1. An apparatus for the continuous casting of molten metal comprising in combination a caterpillar track type mold and a nozzle for feeding said molten metal to said mold, the improvement comprising:

a nozzle comprising a plurality of individually separable hollow elongated tubular sections, each of said sections having a peripheral wall defining at least one feed channel, said plurality of sections being mounted in side by side relationship such that a portion of said peripheral wall surface of one of said plurality of sections abuts a portion of said peripheral wall surface of another of said plurality

of sections wherein the abutting portions of said peripheral wall surfaces of said plurality of hollow sections form





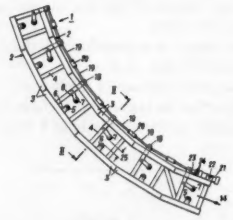
a channel substantially parallel to said at least one feed channel.

4,290,478

GUIDING STAND TO BE USED IN A CONTINUOUS CASTING PLANT

Franz Kagerhuber, Traun, and Günter Holleis, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 7, 1979, Ser. No. 46,344
Claims priority, application Austria, Jun. 14, 1978, 4330/78
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—448 **5 Claims**



1. In a guiding stand to be used in a continuous casting plant for casting a strand, for example a casting plant for casting a billet or bloom, and of the type including a supporting framework, rollers arranged at said supporting framework so as to support the strand at opposing sides thereof, guide rods pivotably arranged at said supporting framework to carry at their ends the rollers of at least one of said opposing sides of the strand and adjustment means for pivoting said guide rods so as to allow for an adjustment of the rollers to various strand thicknesses, the improvement comprising:

coupling rods connecting the guide rods of neighbouring rollers in the manner of a four-bar linkage such that the guide rods of neighbouring rollers are pivotally connected both to the framework and to the coupling rods;

angle levers as said guide rods, each lever comprising a first lever arm and a second lever arm which together enclose a certain angle, a roller being hinged to an end of said first lever arm and a coupling rod being hinged to an end of said second lever arm, said angle levers being pivotably mounted at said supporting framework near their angle apex; and

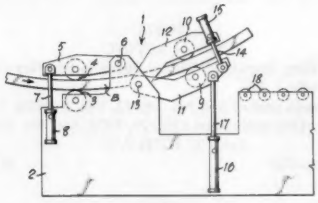
an arcuate guiding stand having a center of curvature and a beginning where the strand enters it as said guiding stand, said second lever arms to which said coupling rods are hinged, in their mid-position, being directed in a radial manner in a direction toward the center of said arcuate guiding stand and being connected by said coupling rods in the manner of four-bar linkage trapezoids, said first lever arms of neighbouring rollers having stepwise decreasing lengths, the longest first lever arm being the first lever arm that carries the roller arranged at the beginning of said arcuate guiding stand, the first lever arms carrying the rollers following upon the roller arranged at the beginning of said arcuate guiding stand each being shortened by a certain measure relative to the preceding first lever arm.

4,290,479

DRAWING AND STRAIGHTENING MACHINE FOR USE IN CONTINUOUS CASTING PLANTS

Piero Colombo, 21, Via G. Ferraris, Udine, Italy

Filed Dec. 27, 1979, Ser. No. 107,505
Claims priority, application Italy, Dec. 28, 1978, 12916 A/78
Int. Cl.³ B22D *11/08, 11/128*
U.S. Cl. 164—448 **3 Claims**



1. A drawing and straightening machine for use in continuous casting plants presenting a curved guide path for bending the casting leaving the casting mold, from a substantially vertical direction to a rectilinear direction different from the vertical comprising:

(a) a first pair of pinch rolls arranged at a point of separation between the lower end of a curved guide path section and a rectilinear guide section, at least one of the rolls of said first pair being positively driven into rotation;

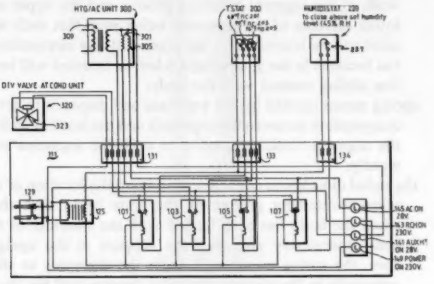
(b) a second pair of pinch rolls, arranged subsequently to said first pair of pinch rolls, in the direction of movement of the continuous casting, and in the zone of the rectilinear guide section, said second pair of pinch rolls being mounted on a pair of roll carrier frames, said pair of roll carrier frames being pivotally secured to a machine frame having a pivot axis located between said first and second pairs of pinch rolls, and means for pivotally moving said pair of roll carrier frames and said second pair of pinch rolls in a substantially vertical direction to a lower straightening position for alignment with said rectilinear guide section, and to an upper starting position wherein said second pair of pinch rolls lies substantially on an upwardly directed portion of the curved path of the continuous casting; and

(c) means interconnecting each of said roll carrier frames for adjusting the pinch pressure between the second pair of rolls in a manner independent of the vertical positioning of said second pair.

4,290,480
ENVIRONMENTAL CONTROL SYSTEM

Alfred Sulkowski, 4 Oak Dr., Marlboro, Conn. 06447

Filed Mar. 8, 1979, Ser. No. 18,847
Int. Cl.[3] F24F 3/14
U.S. Cl. 165—21 38 Claims



1. A system providing for temperature and humidity control of an environment comprising:

switching means for regulating a temperature control means including air cooling and air heating means, having a plurality of replaceable standard relays and associated contacts therefor with few moving parts;

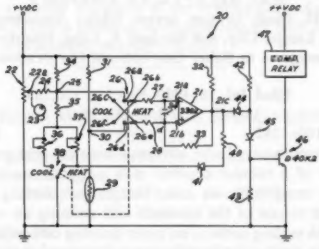
a temperature sensor coupled with the switching means, and capable of activating the switching means and consequently the temperature control means at certain temperature settings including for heating, turning the heating means on below a certain temperature of the environment and off above a certain temperature, and for cooling, turning the cooling means on above a certain temperature and off below a certain temperature;

a humidity sensor responsive to moisture in air coupled with the switching means and capable of activating the switching means and consequently the temperature control means at a certain level of humidity for dehumidification by turning the cooling means on above a certain humidity level and off below a certain humidity level independently of the operation of the temperature sensor.

4,290,481
ELECTRONIC THERMOSTATIC CONTROL FOR A HEAT/COOL ROOM AIR CONDITIONING SYSTEM

Walter J. Pohl, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 12, 1980, Ser. No. 148,090
Int. Cl.[3] F25B 29/00, 13/00
U.S. Cl. 165—26 5 Claims



1. In a heat/cool room air conditioning system having a temperature sensor positioned above or below the comfort zone of the room space, an electronic temperature differential thermostatic control circuit operable during the heating and cooling modes of operation comprising:

a comparator circuit having a pair of input terminals and an output terminal and being switchable between two output states dependent on the relative polarity of two potentials applied to the input terminals;

means for applying to a first of the input terminals a reference potential representative of a setpoint temperature for the room comfort zone;

means including said temperature sensor for applying to the second of said input terminals a variable potential representative of sensed air temperature outside the comfort zone;

feedback means coupling the comparator output to one of the input terminals for establishing a temperature differential between two sensed temperatures at which switching of the comparator occurs from one state to another and back, respectively;

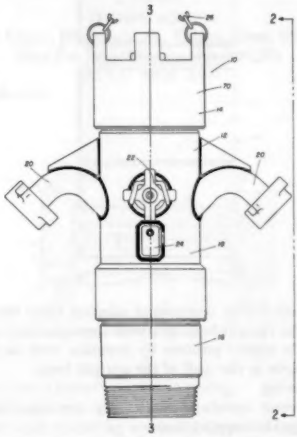
and means including a heat/cool mode switch for altering the effect that the feedback means has on the temperature differential between a first predetermined effect operative during the cool mode to a second predetermined effect operative during the heat mode;

whereby the control circuit compensates for the opposite influence that air temperature stratification has in the heat and cool operating modes on the disparity between the sensed air temperature and the actual comfort zone temperature.

4,290,482
PLUG CONTAINER

David P. Brisco, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1980, Ser. No. 145,185
Int. Cl.[3] E21B 33/03, 33/14, 33/16
U.S. Cl. 166—70 3 Claims



1. A plug container for use in well cementing operations having one end thereof secured to the pipe being cemented in said well, said plug container comprising:

plug body means having a central bore therethrough, having a plurality of apertures therein, and having a plurality of fluid inlet ports therein, each fluid inlet port entering said plug body means at an acute angle with respect to the axis of the central bore of said plug body means;

fluid inlet conduit means, each fluid inlet conduit means being secured to said plug body means communicating with a fluid inlet port of the plurality of fluid inlet ports, each fluid inlet conduit means comprising:

arcuate shaped fluid inlet conduit means having one end secured to said plug body means communicating with a fluid inlet port of the plurality of fluid inlet ports, hav-

ing connection means on the other end thereof and having removable protector means thereon for releasably engaging the connection means to protect the connection means from damage when not in use;

plug body nipple means having one end secured to the other end of said plug body means and having the other end thereof secured to one end of said pipe being cemented in said well;

plug release plunger assembly means secured to said plug body means having a portion thereof extensible into the bore of said plug body means through an aperture therein of the plurality of apertures therein;

plug release indicator assembly means secured to said plug body means comprising housing means, pin means rotatably mounted in the housing means, and lever means extending through an aperture in said plug body means and being secured to the pin means; and

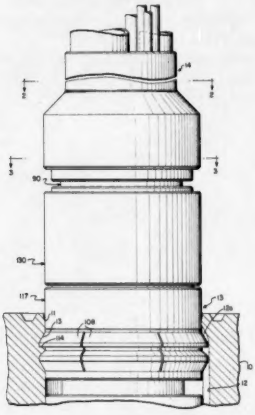
reinforcing means secured to said plug body means and said fluid inlet conduit means.

4,290,483

LATCH MEANS FOR WELL TOOLS AND COMPONENTS

John E. Lawson, Rutland Court, England, assignor to Armco Inc., Middletown, Ohio

Filed Feb. 11, 1980, Ser. No. 120,052
Int. Cl.[3] E21B *23/02*
U.S. Cl. 166—237 **8 Claims**



1. In a well tool or component adapted to be landed on a support in the upright bore of a well apparatus and releasably secured in its landed position by coaction with an inwardly opening groove in the wall of the upright bore,

a body having

a transverse annular downwardly directed shoulder to engage the support, and

a transverse annular outwardly opening segment-retaining groove located above the shoulder,

the segment-retaining groove having upper and lower side walls which are flat and uninterrupted;

a plurality of arcuate latch segments disposed in an annular series in the latch-retaining groove and each having

a flat upper surface,

a flat lower surface,

a first cylindrical outer surface portion extending downwardly from the upper surface,

a frusto-conical camming surface which tapers upwardly and inwardly and terminates at the bottom of the first cylindrical outer surface portion,

a second cylindrical outer surface portion extending downwardly from the bottom of the camming surface,

a latching shoulder located at the bottom of the second cylindrical outer surface portion and extending outwardly therefrom, and

an outer surface portion extending downwardly from the latching shoulder;

the axial dimensions of the segment-retaining groove and the latch segments, and the flat nature of the upper and lower walls of the segment-retaining groove and the upper and lower surfaces of the segments, being such that each segment can be inserted into the groove at any circumferential location in the groove and when so inserted will be in free sliding contact with the body;

spring means carried by the segments and disposed to act in compression between the segments and the bottom wall of the segment-retaining groove to urge the segments outwardly;

the radial dimensions of each segment and the location of the segment-retaining groove on the body being such that, when the body has been landed with the shoulder of the body operatively engaging the support in the upright bore, the spring means will cause the segments to slide outwardly in the segment-retaining groove until the latching shoulder of each segment is engaged with a coacting shoulder presented by the inwardly opening groove in the upright bore,

the first cylindrical outer surface portion of the segment then being spaced inwardly from the wall of the upright bore; and

combination segment retracting and retaining means carried by the body above the latch-retaining groove and comprising an annular member having

a lower end dimensioned to engage the camming surfaces of the latch segments, and

a cylindrical inner surface dimensioned to embrace the first cylindrical outer surface portions of the segments;

the segment retracting and retaining means being movable between an upper position, in which the annular member embraces the first cylindrical outer surface portions of the segments and the segments are held in the segment-retaining groove by that engagement, and a lower position, in which the annular member embraces the second cylindrical outer surface portions of the segments,

movement of the annular member downwardly from its first position to its second position causing the segments to be retracted into the segment-retaining groove and out of engagement with the inwardly opening groove of the upright bore as a result of coaction of the lower end of the annular member with the camming surfaces of the segments.

4,290,484

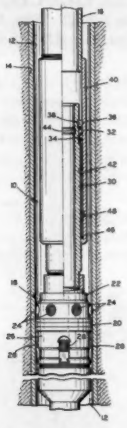
SEAL RECEPTACLE ASSEMBLY

Clifford H. Beall, Broken Arrow, Okla.; Amareswar Amancharla, League City, and Michael A. Luke, Houston, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Jul. 18, 1980, Ser. No. 170,209
Int. Cl.[3] E21B *23/00, 33/10*
U.S. Cl. 166—242 **18 Claims**

18. A latch assembly for affixation between first and second members of a tubular conduit in a subterranean well, said assembly comprising: an inner body sleeve having one end connected to one of the members and defining an outwardly facing first sealing surface; an outer housing circumjacent said inner body sleeve and having one end connected to the other of the members, said outer housing defining an inwardly facing second sealing surface; an annular seal means having an inner surface sealingly engaging said first sealing surface and an outer surface sealingly engaging said second sealing surface; securing means for releasably securing said seal means to said inner body sleeve; and releasing means operable by extreme

upward movement of said outer housing for releasing said securing means and permitting said seal means to be shifted



onto and carried by said second sealing surface and to move upwardly with said outer housing, for retrieval from the well.

4,290,485

REDUCTION OF WATER PRODUCTION FROM HYDROCARBON CONTAINING SUBSURFACE FORMATIONS

Dustin L. Free, Tulsa, and Howard M. Phillips, Oklahoma City, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 8, 1972, Ser. No. 251,345
Int. Cl.[3] E21B *33/138, 43/27*
U.S. Cl. 166—281 **16 Claims**

1. In the method of treating a subsurface oil and water-producing interval of a formation located adjacent to a well bore to decrease the volume ratio of water to oil produced therefrom wherein an aqueous solution of a partially hydrolyzed polyacrylamide, said solution being substantially free of a crosslinking agent for said polyacrylamide, is injected into the producing formation and then producing fluids from said formation, the improvement which comprises: acidizing the interval to be treated prior to the injection of polymer solution to increase the injectivity of the interval; crosslinking the polymer after it is introduced into the formation and prior to producing fluids from the treated formation by contacting said polymer with an aqueous solution containing a water soluble salt of a di or trivalent metal cation or an organic crosslinking agent so that said polymer is crosslinked to a degree sufficient to achieve a greater reduction in the volume ratio of water to oil produced than is obtained with injection of only said substantially uncrosslinked polyacrylamide.

4,290,486

METHODS AND APPARATUS FOR SEVERING CONDUITS

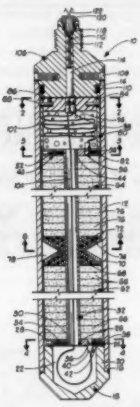
John A. Regalbuto, Fort Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Jun. 25, 1979, Ser. No. 52,031
Int. Cl.[3] E21B *43/116*
U.S. Cl. 166—297 **33 Claims**

1. Apparatus for severing a conduit along a plane extending transversely through the conduit comprising:

two aligned, confined cylindrical explosive charges positioned relative to each other for alignment along the longitudinal axis of the conduit and each including a distal end and a convexly shaped proximal end, said proximal ends facing each other and defining an explosive-free space separating the remaining portion of one of the charges from the remaining portion of the other charges;

a liner formed of high density ductile material positioned adjacent each of said proximal ends of said charges, said liners having shapes conforming with the shapes of said



proximal ends of said charges and having radially increasing thicknesses; and

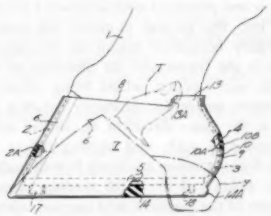
means at the distal ends of said charges for simultaneously initiating detonation of the charges at the distal ends thereof.

4,290,487

HORSE BOOT

William O. Unger, 355 Rustic Pl., Eugene, Oreg. 97401

Filed Feb. 19, 1980, Ser. No. 122,298
Int. Cl.[3] A01L *3/00*
U.S. Cl. 168—18 **3 Claims**



1. A boot for a horse's hoof comprising,

a sole having a rear edge,

a resilient wall extending upwardly from the sole perimeter and including a frontal portion, side portions and a rear portion, said rear wall portion of rearwardly protuberant configuration, said rear wall portion including an elevated rim portion providing a rear wall portion of greater height than the remaining portions of the boot wall, said elevated rim portion terminating laterally in end surfaces located substantially above the juncture of the rear and side portions of the boot wall and adapted to receive the application of finger exerted pressure during manual repositioning of the rear wall portion to a reversed position downwardly below said rear edge of the sole to permit passage of a hoof in a direction generally parallel to said sole into place on the sole whereupon the rear wall portion may be restored to its raised normal position, said reversed position permitting the frontal and side portions of the boot

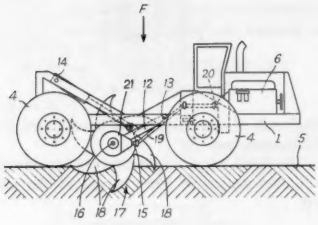
wall to avoid radical inward displacement and remain unobstructive of hoof entry.

4,290,488

DRIVING MACHINE INCLUDING SPEED SYNCHRONIZED EARTH WORKING TRACTION WHEEL

Gilles Pelsy, Ferme de l'Epina, 55400 Maucourt/Orne, France (55400)

Filed Nov. 14, 1979, Ser. No. 94,334
Claims priority, application France, Dec. 5, 1978, 78 34251
Int. Cl.³ A01B *33/02, 33/10*
U.S. Cl. 172—123 **10 Claims**



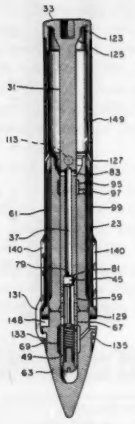
1. A public works machine comprising:
a frame;
moving members, such as wheels or caterpillar tracks, on which said frame rests for forward movement on the ground,
drive means coupled to said moving members for driving said moving members,
a traction wheel provided with a plurality of teeth for penetration into the ground mounted for rotation about a substantially horizontal rotational axis extending transversely to the frame and the direction of travel of the machine, said traction wheel being coupled to power transmission means for drivingly rotating said traction wheel in the same direction as, and in constant speed synchronization with, said moving means to provide a reactive force between a leading face of each tooth of the traction wheel and the earth tending to cause forward movement of the machine, said traction wheel being positionable with respect to the frame by means of a support in a position in which the distance between the rotation axis of said traction wheel and the ground is less than the distance separating the rotation axis from the outer end of each tooth of the traction wheel, said power transmission means including synchronizing means for maintaining the ratio of the speed of rotation of the traction wheel to the speed of the moving members at a constant value so that the outer end of each tooth of said traction wheel has a linear speed which is substantially equal to the linear speed of forward movement provided by said moving members, wherein each tooth had a leading face and a trailing face with respect to its rotational movement and the profile of the leading face of each tooth is an involute profile resulting in a minimum amount of vertical force being exerted by said profile on the ground during the rotation of the wheel and penetration of the earth by each respective tooth so as to minimize the power required for penetrating the earth by each tooth.

4,290,489

VIBRATIONLESS PNEUMATIC TOOLS

Charles Leavell, 10 Desabla Rd., San Mateo, Calif. 94402

Continuation of Ser. No. 534,070, Dec. 18, 1974, abandoned.
This application Feb. 29, 1980, Ser. No. 125,794
Int. Cl.³ B25D *9/06*
U.S. Cl. 173—17 **35 Claims**



1. A high efficiency pneumatic system comprising:
a pneumatic motor;
a drive element in said pneumatic motor having an oscillatory motion, said oscillatory motion being produced by intermittent substantially adiabatic expansion of a gas having pressure and temperature values greater than the ambient pressure and temperature values in order to actuate said drive element against an opposing force;
force transmitting means to convey said opposing force to said drive element without conveying said oscillatory motion of the source of said opposing force;
a compressor in which said gas is compressed substantially adiabatically to retain the heat energy produced during compression;
a conduit to convey said gas from said compressor to said pneumatic motor with a minimal loss of heat energy; and
valving means to selectively admit discrete portions of said gas in said conduit to actuate said drive element against said opposing force, said valving means determining that each of said portions of gas admitted by said valving means to actuate said drive element is an amount of gas that will expand to substantially ambient pressure while actuating said drive element to its maximum displacement against said opposing force.

4,290,490

ROOF BOLTING DEVICE

Henry P. Barthe, Pittsburgh, and William R. Cobb, Murrysville, both of Pa., assignors to Schroeder Brothers Corporation, McKees Rocks, Pa.

Filed Apr. 16, 1979, Ser. No. 30,219
Int. Cl.³ E21C *11/02, 27/22;* **E21D** *20/00*
U.S. Cl. 173—23 **6 Claims**

1. A roof drilling and bolting device comprising
a mobile chassis comprising a frame extending to and supporting a front edge, said frame not extending forwardly of said front edge,
two operator cabs having floors and canopies,
telescoping means secured to the front edge comprising at least one large tubular member and at least two extensible members telescoped with said large tubular member for slidably supporting the operator cabs on the front edge of

the chassis, said extensible members each collapsible within the nominal width of the chassis, said extensible members extendible outwardly of the normal width of the chassis to support said cabs laterally outwardly of the nominal width of the chassis, said extensible members being independently actuatable to independently position said cabs, and

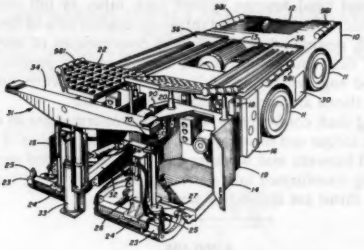
drilling assemblies associated with each cab including a drill pod and means for rectilinearly positioning the drill pods up-and-down and side-to-side in front of the cabs.

6. A roof drilling and bolting device comprising

a mobile chassis comprising a frame extending to and supporting a front edge, said frame not extending forward of said front edge,

two operator cabs having floors and canopies,

telescoping means secured to the front edge comprising at least one large tubular member and extensible members



telescoped within the large tubular member for slidably supporting the operator cabs on the front edge of the chassis, said extensible members each collapsible within the nominal width of the chassis, said extensible members extendible outwardly of the nominal width of the chassis to support said cabs laterally outward of the normal width of the chassis, said extensible members being independently actuatable to independently position said cabs, said means for slidably supporting the cabs comprising means for raising and lowering said cabs,

means for raising at least the front edge of the said canopies,

drilling assemblies associated with each cab including a drill pod,

means for rectilinearly positioning said drill pod up-and-down and side-to-side along the front edge of the cab, and

a temporary roof support positioned by a boom extending forwardly of the front edge of the chassis.

4,290,491

ROCK DRILL POSITIONING MECHANISM

James R. Mayer, Englewood, Colo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 31, 1978, Ser. No. 938,613
Int. Cl.[3] E21C *5/00, 9/00*
U.S. Cl. 173—43 **17 Claims**

1. A rock drill positioning mechanism for positioning a drill feed bar or the like in combination with an elongated movable boom, said positioning mechanism being characterized by:

a connecting member pivotally mounted on the distal end of said boom;

a mounting arm pivotally connected to said connecting member;

actuator means interconnected between said connecting member and said arm for pivoting said arm with respect to said connecting member; and,

a rotary actuator mounted on said arm and adapted to support said feed bar for rotating said feed bar about an axis of rotation which may be substantially coincident with the longitudinal axis of said boom depending on the pivotal position of said arm and said connecting member;

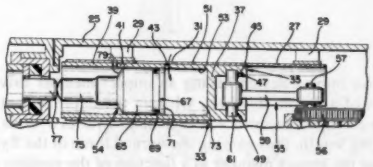
said rotary actuator including a housing connected to said arm and having a cylindrical bore, a piston reciprocably disposed in said bore, at least two sets of cooperable helical splines including internal and external splines formed on said piston, a shaft mounted on said housing for rotation in response to movement of said piston in said bore, said shaft including splines cooperable with said internal splines on said piston, further splines in said housing cooperably engaged with said external splines on said piston, and means interconnecting said shaft and said feed bar so that in response to actuation of said piston to rotate said shaft said feed bar may be rotatably positioned about said axis of rotation.

4,290,492

IDLING AND AIR REPLENISHING SYSTEM FOR A RECIPROCATING HAMMER MECHANISM

Daniel H. Sides, New Freedom, Pa., and Hanspeter E. Beisch, Belair, Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 31, 1979, Ser. No. 8,228
Int. Cl.[3] B25D *11/12;* **B25B** *45/04*
U.S. Cl. 173—118 **5 Claims**



1. A hammer tool having a housing which carries a detachable bit toengage a work piece,

(a) drive means mounted in the housing to power the tool,

(b) a barrel fixedly connected to the housing, and in communication with the atmosphere,

(c) the barrel has an open forward end and an open rearward end,

(d) an air passageway formed intermediate the ends of the barrel,

(e) a piston member slidingly disposed in the barrel, the piston member has a closed end adjacent the rearward end of the barrel, and the piston member has an open end adjacent the forward end of the barrel,

(f) the piston member connected to be reciprocated by the drive means,

(g) a ram slidingly disposed in the open end of the piston freely to move substantially forward of the open end of the piston member in an idling mode defined by the absence of the bit, and the ram to reciprocate responsive the driven piston member to deliver impact blows to the bit in a hammering mode defined by the presence of the bit,

(h) the ram having a sealing surface disposed opposite the closed end of the piston member,

(i) a chamber means of variable volume formed in the open end of the piston member between the closed end of the piston member and the sealing surface of the ram,

(j) a front port and a rear port formed in the open end of the piston member in predetermined spaced relationship to each other,

(k) the rear port to communicate the chamber means with the barrel air passageway upon the piston member reaching the limit of its forward travel to permit replenishing air in the chamber means, and thereafter said communication

between the chamber means and the barrel air passageway being selectively closed by the independent motions of the ram or the piston member during the hammering mode, the rear port continuously communicating with the chamber means during the idle mode, and

(l) the front port during the hammering mode is closed by the ram, the barrel, or by both the ram and the barrel, the front port to intermittently communicate the barrel air passageway with the chamber means during the idling mode upon the rear port being closed by the barrel and the sealing surface of the ram being disposed forwardly of the front port.

4,290,493

CONFIGURED IMPACT MEMBER FOR DRIVEN FLYWHEEL IMPACT DEVICE

James E. Smith, Boulder, Colo., and Gordon P. Baker, Amelia, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Sep. 6, 1979, Ser. No. 73,030
Int. Cl.³ B25C *1/06*
U.S. Cl. 173—124 **7 Claims**

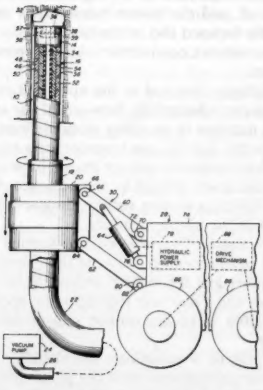
1. An impact device having an impact member driven by means of a driven flywheel, wherein the improvement comprises an impact member whose thickness varies over its entire working length, thus varying the normal force of the flywheel against the impact member as a function of the position of the impact member in its working stroke.

4,290,494

FLEXIBLE SHAFT AND ROOF DRILLING SYSTEM

John H. Blanz, Carlisle, Mass., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 2, 1978, Ser. No. 946,401
Int. Cl.³ B23Q *5/00*; E21C *5/00*
U.S. Cl. 173—149 **11 Claims**



1. A flexible drill shaft for transmitting torque and thrust, one end of said shaft defining a working end, said shaft comprising:

(a) a first flat band wound in a helical configuration defining an outer casing, edges of adjacent convolutions of said first flat band in nesting relationship with one another; and

(b) a second flat band wound in a helical configuration defining an inner casing that is disposed within said outer casing, edges of adjacent convolutions of said second flat band in nesting relationship with one another;

(c) said outer casing and inner casing coaxially disposed about a longitudinal axis of said shaft and extending the length of said shaft, said outer casing wound in a first direction and said inner casing wound in a second direction, said first direction opposite said second direction, said first band and said second band configured to transform said flexible shaft into a substantially rigid shaft when torque and thrust are applied to said flexible shaft, an inner face of said first flat band and an outer face of said second band bearing against each other in full surface contact when torque and thrust are applied to said flexible shaft, nesting edges of adjacent convolutions of each of said first and second bands having mating profiles for fitted engagement and full surface contact when torque and thrust are applied to said flexible shaft;

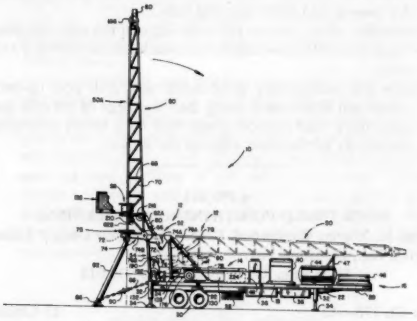
(d) said shaft configured to be engaged intermediate its ends by a torque and thrust applying device, the portion of said shaft between said working end and said engaged section being transformed into a straight rigid shaft when torque and thrust are applied by said device.

4,290,495

PORTABLE WORKOVER RIG WITH EXTENDABLE MAST SUBSTRUCTURE, PLATFORM MOUNTED DRAWWORKS AND ADJUSTABLE WELLHEAD ANCHOR

Thomas L. Elliston, Fort Worth, Tex., assignor to Hydra-Rig, Inc., Fort Worth, Tex.

Filed Jun. 18, 1979, Ser. No. 49,954
Int. Cl.³ E21B *15/00, 19/14*
U.S. Cl. 175—85 **57 Claims**



1. A transportable mast assembly for a workover rig comprising:

a portable rig support platform;

a mast supported substructure including a cantilever support base projecting beyond the support platform in a workover position;

an elongated mast pivotally mounted on the mast support substructure for movement from a reclining transport position overlying the rig support platform to an erect workover position overlying and engaging the support base;

the mast including pipe engaging means movable along the mast for engaging and hoisting a pipe string;

a mast carriage assembly mounted on the support platform

and connected to the mast support substructure for moving the mast support substructure between the transport position and the workover position wherein the support base projects above and beyond the support platform;

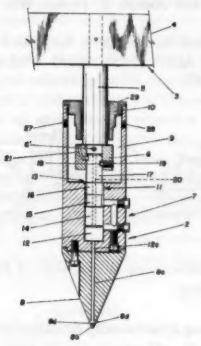
first power means operatively coupled intermediate the support platform and the carriage assembly for selectively moving the mast support substructure from the transport position to the workover position to place the support base over a wellhead; and,

second power means operatively coupled intermediate the mast support substructure and the mast for selectively erecting the mast from the transport position to the erect workover position whereby the pipe engaging means may be operated to engage and hoist a pipe string from the wellhead.

4,290,496
COMBINATION IMPACT AND PRESSURE LIQUID ROCK DRILL

Aubrey C. Briggs, 3 Scheffield Dr., (Rosslyn Farms), Carnegie, Pa. 15106

Filed Oct. 19, 1979, Ser. No. 86,279
Int. Cl.[3] E21B *1/06*
U.S. Cl. 175—321 **10 Claims**



1. A rock drill comprising in combination means for cutting rock comprising a reciprocating impact driver having an axially extending shaft-like impact transmitting extension at its lower end and the cutter unit connected together through a lost motion connection with the said extension to allow limited relative axial movement between the driver and cutter unit, the cutter unit having a cutting bit extending axially from its free end, a liquid holding reservoir in the cutter unit, a pressure cylinder in the cutter unit, and combined valve and piston means operated by said relative movement between the driver and cutter unit for forcing water from the pressure cylinder through the cutter bit during the impact stroke of the driver arranged to transfer liquid from said reservoir to the high pressure cylinder on the succeeding reverse stroke of the driver.

4,290,497
AUTOMATIC WEAR COMPENSATING SEAL DEVICE

Eduardo Barnetche, Ave. Universidad Num. 482, Mexico City 13, Mexico

Filed Jul. 24, 1979, Ser. No. 60,055
Int. Cl.[3] E21B *10/08*; F16J *15/34, 15/54*
U.S. Cl. 175—371 **34 Claims**

1. An axial seal device for forming a seal between first and second members, said seal device comprising:

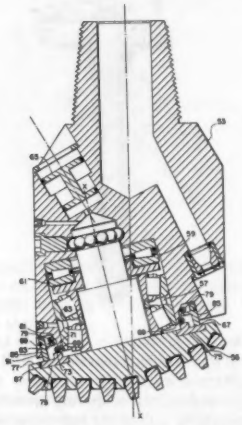
(a) an elastic sealing means positioned between said first and second members such that the elastic force of said sealing means holds said sealing means against at least one of said first and second members; and

(b) an inclined surface on said first member, said surface being inclined at an acute angle with respect to the plane of said sealing means, wherein the inner peripheral surface of said sealing means contacts said first member on the inclined surface thereof to form a seal therebetween and wherein the reaction force to the elastic force of said sealing means on said inclined surface holds said sealing means in contact with said second member to form a seal therebetween and wherein the inclined surface of said first member is rougher than the portion of the surface of said second member which contacts said sealing means.

20. In a rotary drill for drilling a well in the surface of the earth, said drill comprising:

(a) a drill bit including an upper portion for connection to a drill string, duct means including a fluid outlet into the well for carrying fluid to extract detritus and clean the bottom of the well and receiving means;

(b) a solid cutting head comprising a conical head portion and a unitary stem portion with no internal passages therein, said conical head portion including holes therein and cutting elements inserted in said holes, said stem portion being received in said receiving means of said drill bit, wherein said stem and said receiving means include



holding means for rotatably holding said cutting head in said drill bit;

(c) bearing means between said drill bit and said conical head, said bearing means being fixed relative to said drill bit and to said conical head for preventing movement between bearing surfaces of the bearing means which contact the drill bit and conical head on the drill bit and conical head, but allowing said conical head to rotate relative to said drill bit;

(d) a lubrication system, independent of said duct means, interconnected between said drill bit and said cutting head said lubricating system including a stabilizer means for equalizing the pressure in the lubricating system with the pressure in the bore hole surrounding the bit; and

(e) a seal device between said upper portion and said solid cutting head;

the improvement wherein said seal device is an automatic wear compensating seal device comprising:

(1) a first surface and an inclined second surface on said upper portion said inclined second surface being inclined at an obtuse angle with respect to the plane of said first surface;

(2) a third surface on said cutting head;

wherein said cutting head is positioned adjacent to said

upper portion along an axis perpendicular to said first surface; and

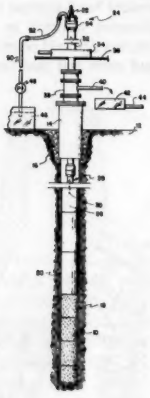
(3) a first elastic sealing means contacting said inclined second surface such that the elastic force of said first sealing means has a first component perpendicular to said axis for maintaining said first sealing means in contact with said inclined second surface and a second component parallel to said axis which causes a reaction force for maintaining said first sealing means in contact with said third surface.

4,290,498

ABLATIBLE DRILL

William C. Triplett, 3154 Reid Dr., Corpus Christi, Tex. 78404, and Walter H. Brauer, 3725 Wakeforest, Houston, Tex. 77098

Filed Apr. 11, 1979, Ser. No. 29,031
Int. Cl.[3] E21B *10/60*
U.S. Cl. 175—379 **9 Claims**



1. A drill string comprising

a string of drill pipe having a plurality of drill collars on the lower end thereof; and

a bit, having a multiplicity of cutting elements, connected with the lowermost drill collar and comprising a plurality of interconnected joints defining a vertical axis, each joint including a matrix having therein a multiplicity of inclusions substantially harder than the matrix, the inclusions being distributed throughout the matrix from adjacent the axis to adjacent the periphery of each joint, the inclusions comprising the cutting elements.

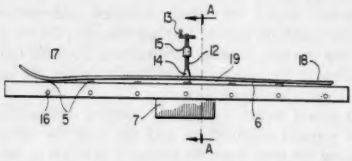
4,290,499

APPARATUS FOR TESTING AND FITTING CROSS-COUNTRY SKIS

Mauri Luomaranta, Sault Ste. Marie, Canada, assignor to Scandinavian Ski Shop Limited, Sault Ste. Marie, Canada

Filed Apr. 28, 1980, Ser. No. 144,307
Claims priority, application Canada, Mar. 12, 1980, 347499
Int. Cl.[3] G01G *23/36, 3/14*
U.S. Cl. 177—48 **10 Claims**

1. A flat bed adapted to support a cross-country ski, sensor means distributed at pre-determined points along the length and width of said flat bed, each of said sensor means being adapted to emit a signal in response to force exerted on it by the running surface of a cross-country ski supported on said flat bed, display means adapted to indicate the origin of the signals emitted from each of said sensor means, adjustable loading means adapted to exert pre-determined forces to points



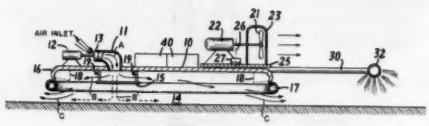
along the top surface of said ski and load measuring means adapted to indicate the amount of the applied load.

4,290,500

GROUND EFFECT FLYING PLATFORM

Harry C. Hopkins, 15 Layfayette St., White Plains, N.Y. 10606; Bernhard H. Goethert, 1703 Sycamore Cir., Manchester, Tenn. 37355, and Joseph K. Power, Box 67, Rte. 1, Alpine, Ala. 35014

Filed Nov. 5, 1979, Ser. No. 91,178
Int. Cl.[3] A01C *23/00;* A01M *7/00;* B60V *1/16*
U.S. Cl. 180—117 **16 Claims**



1. A ground-effect vehicle capable of hovering above the ground comprising:

a base frame;

a skirt extending downwardly from the periphery of the base frame;

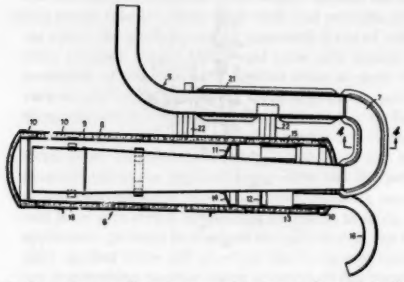
air source means located on the base frame for injecting an air flow with a particular velocity downwardly through an aperture in the base frame to create an air cushion of high pressure air in a pressure space bounded by the base frame, the skirt and the ground, said air pressure being sufficient to lift the vehicle and to allow the air to escape under said skirt; and

deflector means for diverting the downward air flow into an air flow parallel to the ground and reducing the velocity of said air flow as it passes under the skirt, said deflector means including first, second and third plates, said first plate being located in a plane substantially parallel to the ground when the vehicle is in level flight and being at the horizontal position of the aperture in the base frame, but vertically spaced therefrom, so as to form a horizontal discharge gap, said first plate having a circumference sufficent to give the discharge gap an area large enough to significantly reduce the velocity of the air flow, said second and third deflector plates being positioned along the circumference of the skirt generally parallel to and perpendicular to the skirt, respectively, the second and third deflector plates being joined at one end, the second and third deflector plates also being perforated and positioned to intercept the parallel air flow, the second and third reflector plates forming an intermediate pressure area within said pressure space so as to reduce the velocity of the air flow as it escapes under the skirt.

4,290,501
EXHAUST SILENCER, ESPECIALLY FOR SMALL VEHICLES

Ko Tanaka, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 19, 1979, Ser. No. 4,929
Int. Cl.[3] F01N 7/08
U.S. Cl. 181—228 5 Claims

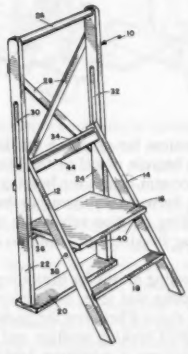


1. An exhaust silencer comprising: an elongated silencer chamber having an axis, an axial peripheral inner wall with perforations therethrough, an axial outer peripheral wall extending around said inner wall and leaving a peripheral spacing therebetween, said perforations opening into said spacing, sound absorbing material placed in said spacing, and a gas outlet port; a U-shaped exhaust pipe having a first arm outside of said silencer chamber and parallel to said axis, a second arm entering at one end of said silencer chamber and extending axially into said chamber for the major portion of the length of said chamber, and spaced from said inner peripheral wall, a bight portion joining said arms outside of said silencer chamber, said bight portion comprising a pair of spaced-apart walls, and sound absorbing material in the region between said walls of said bight portion, said outlet port being substantially axially spaced from the outlet end of said second arm.

4,290,502
FOLDING STEP STOOL

John B. Anderson, 8248 Royal Gorge Dr., San Diego, Calif. 92119

Filed Sep. 10, 1979, Ser. No. 74,150
Int. Cl.[3] A47C 13/00
U.S. Cl. 182—33 10 Claims



1. A folding step stool comprising:

a frame having a floor engaging terminus and having at least two substantially vertical uprights,

plurality of legs been carried on said frame by mounting means for movement of said legs between extended and retracted positions,

said legs comprising means in said extended position for extending into engagement with a horizontal floor and for coacting with said frame lower terminus to support said uprights substantially vertically, said legs, in said retracted position being adapted to lie closely against said frame,

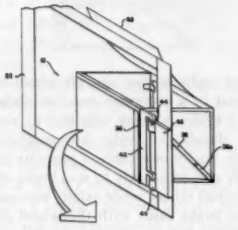
at least one platform-step pivotally mounted adjacent a first edge on said legs and pivotal mounted adjacent the opposite edge on said upright, said platform step lying entirely within the vertical projection of a planar area defined by said floor engaging terminus and the bottom surface of said legs in said extended position,

at least one additional step carried by said legs and lying within the vertical projection of said area but extending beyond the vertical projection of a area defined by said step platform when said legs are in said extended position.

4,290,503
PORTABLE SECURITY FIRE ESCAPE

Wayne A. Briles, 301 South St., Andrews Pl., #307, Los Angeles, Calif. 90020

Filed Jan. 16, 1980, Ser. No. 112,554
Int. Cl.[3] A62B 3/00
U.S. Cl. 182—47 13 Claims



1. In a fire escape housing for erection within and outwardly swingable from an opening in a building, comprising:

(a) A collapsible housing for accomodation, when erected, of humans therewithin;

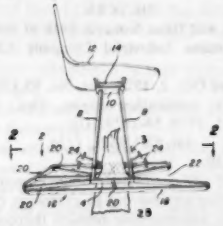
(b) articulated means one section of which is mounted to the housing;

(c) receiving means mounted to the exterior wall of the building adjacent the opening therein and connectible to an unmounted section of the articulated means.

4,290,504
TREE-MOUNTED DEER STAND

Cary Cuba, 1 N. Bryant Blvd., San Angelo, Tex. 76903

Filed Jun. 13, 1980, Ser. No. 159,166
Int. Cl.[3] A47C 7/62
U.S. Cl. 182—187 5 Claims



1. A tree-mounted deer stand for mounting over an upwardly disposed tree stump member, said stand comprising a frame having a downwardly-open socket, said frame including

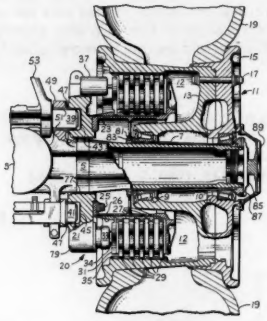
a lower portion adapted to substantially surround said member, legs extending upwardly from said lower portion, seat means mounted on upper ends of said legs, and a foot rest extending outwardly from the lower portion of the frame.

4,290,505

PIN CENTERED BRAKE

Louis T. Kramer, Long Beach, Calif., assignor to McDonnell Douglas Corp., Long Beach, Calif.

Filed Oct. 29, 1979, Ser. No. 89,548
Int. Cl.³ B60T 1/06
U.S. Cl. 188—18 A **10 Claims**



1. An improved multiple disc aircraft wheel brake circumferentially disposed in a complete annulus about an aircraft axle and having a brake housing attached to aircraft landing gear structure, a plurality of brake discs rotationally fixed to said housing while axially moveable, a plurality of wheel discs located alternately and adjacently to said brake discs and radially fixed to an aircraft wheel while axially moveable, means to axially engage the brake discs with the wheel discs, wherein the improvement comprises:

attachment of said brake housing to said aircraft landing gear structure by only two pins attached to said landing gear structure

and extending parallel to the axis of said axle, said two pins being located on a centerline coincident with the diameter of said axle and being symmetrical about a line drawn through the center of said aircraft axle and perpendicular to said centerline, said two pins slideably engaging mating apertures in said brake housing so that said two pins provide radial restraint while providing axial freedom for said brake housing, said brake housing unrestrained by said axle, and said wheel and said brake housing being retained on said axle in an axially stacked fashion by only a single fastener secured to said axle.

4,290,506

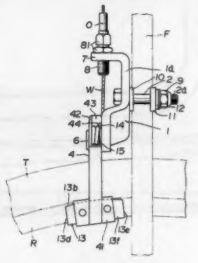
CENTER-PULL TYPE CALLIPER BRAKE FOR A BICYCLE

Masashi Nagano, and Itsuo Someya, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 2, 1979, Ser. No. 81,176
Claims priority, application Japan, Oct. 14, 1978, 53-141137[U]; Mar. 5, 1979, 54-28292[U]
Int. Cl.³ B62L 1/16
U.S. Cl. 188—24.19 **6 Claims**

1. A center-pull calliper bicycle brake comprising:

a horizontal fixing arm having an extension extending from a horizontally intermediate portion thereof in the direction of a control wire; a supporting member for supporting an outer sheath of said control wire connected with said extension, said supporting member having an elongated slot extending in the direction of said extension; a fixing bolt extending through said slot for fixing said fixing arm to a bicycle frame and permitting vertical adjustment of said fixing arm relative to said frame; a pair of brake arms pivoted to respective horizontal ends of said fixing arm; a pair of brake shoe holders integral with and extending from the ends of said brake arms; a pair of brake shoes respectively supported in said holders, each of said brake shoes having a braking surface for engaging with a bicycle



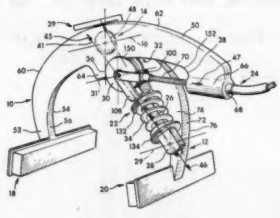
rim, and upper and lower surfaces and a pair of side surfaces in continuation of said braking surface, said upper surface being curved upwardly at a lengthwise intermediate portion thereof along said rim and having a curvature smaller than that of an outer peripheral edge of said rim; and, actuating means connectable to said control wire for causing pivotal movement of said brake arms upon pulling movement of said control wire to thereby actuate said brake.

4,290,507

ACTUATING SYSTEM AND APPARATUS FOR BRAKES AND CLUTCHES AND THE LIKE

Lawrence G. Brown, 1629 Kuhilani St., Honolulu, Hi. 96821

Continuation-in-part of Ser. No. 878,028, Feb. 15, 1978, abandoned. This application Jun. 12, 1979, Ser. No. 47,762
Int. Cl.³ B62L 3/00
U.S. Cl. 188—24.15 **11 Claims**



1. A brake system for applying braking force to retard the movement of a bicycle wheel or the like comprising:

a pair of lever arm means for holding brake pad means for movement between an open non-braking position and a closed braking position relative to the bicycle wheel and for applying braking force thereto in the closed braking position;

pivotal connecting means for providing a central pivotal axis and connecting said lever arm means and enabling pivotal movement thereof between the open non-braking position and the closed braking position and in the closed braking position between a minimum braking force application position and a maximum braking force application position;

force reaction cam surface means on one of said lever arm means for applying actuating force and for causing pivotal

movement of said lever arm means between the various positions;

movable actuating means operably connected to said lever arm means and being movable relative thereto for applying brake actuating force to said surface means and for causing pivotal movement of said lever arm means between the minimum braking force application position and the maximum braking force application position and various selectively controlled force application positions therebetween in response to externally applied force;

spring means operably associated with said movable actuating means for applying spring generated force of substantially constant magnitude to said lever arm means independently of the externally applied force at each of the various selectively controlled force application positions along said surface means and being effective in each position to cause selectively controlled application of braking force to the bicycle wheel through said lever arm means proportional to the applied spring force and the position of said movable actuating means while enabling return of said lever arm means toward the minimum braking force application position in response to reduction of the externally applied force and return of said lever arm means to the non-braking position upon removal of the externally applied force; and

control means connected to said movable actuating means for applying the externally applied force thereto and for causing movement of said movable actuating means relative to said lever arm means resulting in pivotal movement of said lever arm means between the various positions and for changing the location of the place of application of the spring force to the lever arm means relative to the central pivotal axis of said lever arm means.

4,290,508

DISC BRAKE PAD ASSEMBLIES

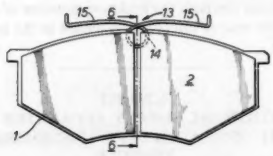
Heinz W. Baum, Saarbrucken Dudweiler, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 31, 1979, Ser. No. 71,497

Claims priority, application United Kingdom, Sep. 14, 1978, 36802/78; Nov. 27, 1978, 46110/78

Int. Cl.³ F16D *65/00*

U.S. Cl. 188—73.38 **9 Claims**



1. A friction pad assembly comprising a backing plate having front and rear faces and friction material secured to said front face, an anti-rattle spring having a bent portion intermediate its ends, and a recess extending across the width of said backing plate from the front to the rear faces thereof, said recess having an opening which extends outwardly through the edge of said backing plate between the front and rear faces thereof said opening being smaller than the largest dimension of said recess, said bent intermediate portion of said spring being seated in said recess and forming a positive connection therewith by the inherent resilience of the bent portion, said recess and said bent portion forming the sole connection between said spring and said backing plate, said recess being accessible to secure the spring to the backing plate after the friction material is secured to the backing plate, said spring being removable from said recess without deformation of said backing plate.

4,290,509

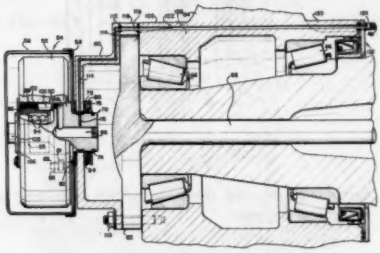
ANTI-LOCK SYSTEM

David O. Hulse, Lionville, Pa., assignor to The Budd Company, Troy, Mich.

Filed Sep. 6, 1979, Ser. No. 73,010

Int. Cl.³ B60T *8/093*

U.S. Cl. 188—181 A **8 Claims**



1. In combination with a source of service pressure for actuating a brake for decelerating a vehicle wheel and means for selectively applying service pressure to the brake,

(a) sensing means attached for rotation about the axis of rotation of said wheel outboard of said wheel;

(b) a source of control pressure located inboard of said wheel and offset with respect to the axis of rotation thereof to control the application of said service pressure to said brake;

(c) means including a passageway therein connecting said sensing means to said source of control pressure through a path removed from the axis of rotation of said wheel; said passage means including a passageway extending through the hub of said wheel, a fixed circular member secured to said vehicle, sealing means between said wheel and circular member, a sealed chamber formed between said rotatable wheel and fixed portion of said vehicle by said sealing means, said wheel and said circular member, and said source of control pressure being connected to said sealed chamber through said circular member;

(d) said sensing means being responsive during normal rotation of said wheel to maintain said control pressure to permit service pressure to be applied to said brake, and

(e) said sensing means being responsive when said wheel is decelerated beyond said predetermined rate to relieve said control pressure to prevent service pressure from being applied to said brake.

4,290,510

WEAR RESISTANT COATED ARTICLE

Richard J. Warren, Howell, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 14, 1978, Ser. No. 969,640

Int. Cl.³ F16D *65/10*; B22F *7/02*

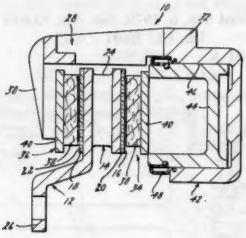
U.S. Cl. 188—218 XL **5 Claims**

1. A brake motor adapted to be used with a caliper braking means comprising:

a body portion adapted to be attached to a wheel of a vehicle and rotate therewith;

a head portion attached to said body, said head having friction surfaces thereon, said friction surfaces positioned so as to allow engagement of said surfaces by brake pads located on and actuated by said caliper, said friction surfaces being coated with a wear resistant material including about 30 to 70 percent by volume of a ceramic particulate material selected from the group consisting of metal carbides and metal nitrides and about 30 to 70 percent by

volume of a binder metal compatible with the ceramic particles and the rotor wherein said metal is an alloy of a



base metal selected from the group consisting of iron, nickel and copper.

4,290,511

LOAD-CARRYING STRUT CONSTRUCTION

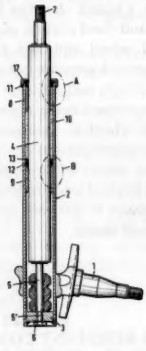
Johannes J. de Baan, and Adolf Adrian, both of Ennepetal, Fed. Rep. of Germany, assignors to Firma August Bilstein, Ennepetal-Altenoverde, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 91,636

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849100

Int. Cl.³ F16F *9/36, 9/54*

U.S. Cl. 188—322.17 **6 Claims**



1. A shock absorbing strut for a vehicle comprising an outer tube for carrying a vehicle wheel axle journal; a shock absorber cylinder slidably axially movable in said outer tube; said cylinder being connected at an end projecting from the outer tube with the vehicle chassis frame and having an exteriorly extending piston rod fastened to the outer tube bottom; a lubricant annular chamber of constant volume closed off by upper and lower fixedly positioned guide rings and sealing rings disposed adjacent said guide rings; said guide and sealing rings being disposed between the shock absorber cylinder and the outer tube; each of said sealing rings being arranged above its respective guide ring in the normal position of strut use with axially limited play and comprising a lubricant sealing felt ring; and a dirt-deflecting ring composed of water-resistant plastic disposed above the upper lubricant-sealing ring for limiting the axial play of said upper lubricant-sealing ring.

4,290,512

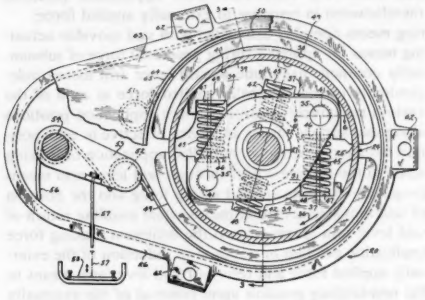
CLUTCH AND BRAKE MECHANISM

Hugh A. Zindler, Rte. 3, Box 264, Pleasant Valley La., Watertown, Wis. 53094

Division of Ser. No. 809,207, Jun. 23, 1977, Pat. No. 4,226,312. This application Sep. 6, 1979, Ser. No. 73,064

Int. Cl.³ B60K *41/20, 41/24*

U.S. Cl. 192—1 **5 Claims**



1. In a power driven implement, rotatable drive and driven members, a power source for the drive member, a drum carried on the drive member, clutch shoes carried on said driven member and being movable relative thereto into and out of clutching engagement with the drum, means biasing the shoes into engagement with the drum to drivingly clutch the drive and driven members together, a brake band for effecting movement of said shoes out of engagement with the drum against the force of said biasing means and to stop rotation of the driven member without interrupting the rotation of the drive member, spaced portions of said brake band being connected to a fixed anchor pin and a movable anchor pin respectively, a pivotally mounted lever carrying said movable anchor pin and being normally movable between angularly spaced brake-on and brake-off positions for the brake band, spring means biasing said lever to the brake-on position for the brake band, means engageable by the lever to interrupt the power source, said power source interrupting means being angularly spaced from the brake-on position of the lever in a direction opposite from the brake-off position of the lever, said spring means biasing the lever through the brake-on position of the lever and into the power source interrupting means in the event of brake band failure.

4,290,513

OPERATION OIL SUPPLY APPARATUS IN OIL PRESSURE OPERATED TYPE TRANSMISSION FOR VEHICLE

Sadanori Nishimura, Omiya, and Yoji Yamada, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 80,781

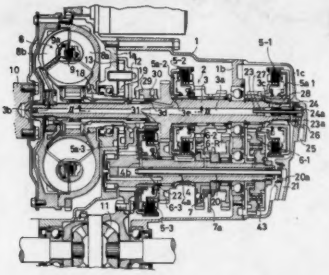
Claims priority, application Japan, Oct. 2, 1978, 53/120405

Int. Cl.³ F16D *35/00, 25/10*

U.S. Cl. 192—3.22 **4 Claims**

1. An operation oil supply apparatus in an oil pressure operated type transmission for a vehicle of such a constructional type that, in a transmission casing, there are contained a transmission mechanism having at least two stage driving trains of a low speed and a high speed including oil pressure clutches of a low speed and a high speed respectively on a pair of rotary shafts extending between one side wall portion and an opposite side wall portion of the transmission casing, and a valve block attached to the one side wall portion and having a manual valve and a shift valve for controlling oil supply to the respective oil pressure clutches and the manual valve has a 1st for-

ward running range in which oil supply is directed selectively through said shift valve to the respective oil pressure clutches and a 2nd forward range in which oil supply to the high speed oil pressure clutch is cutoff and oil supply is given to the low speed oil pressure clutch, characterized in that the high speed oil pressure clutch is supplied with oil under pressure by an oil



supply pipe which extends into an axially extending central opening in the rotary shaft supporting the high speed oil pressure clutch from one end of the shaft, and the low speed oil pressure clutch is supplied with oil under pressure through an oil supply opening in an extension of the valve block which surrounds the rotary shaft supporting the low speed oil pressure clutch.

4,290,514

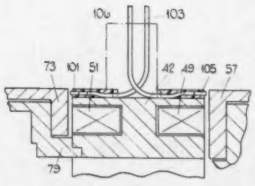
CLUTCH PROTECTION DEVICE

Edmund A. McConnell, Coventry; Norman Yearsley, Kenilworth, and Alec G. Blockley, Coventry, all of England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Continuation of Ser. No. 852,399, Nov. 17, 1977, abandoned. This application Jul. 31, 1979, Ser. No. 62,376

Int. Cl.³ F16D *66/00*

U.S. Cl. 192—30 W **1 Claim**



1. A machine tool having a work spindle, an electromagnetic clutch operatively connected to said work spindle, said clutch having releasably frictionally engageable parts, means for adjusting the relative positions of said parts, electromagnetic means for actuating said frictionally engageable parts and including an electromagnet component and an armature component, which components are relatively movable and, in use, are spaced apart by a gap, the width of which is governed by said means for adjusting the relative positions of said frictionally engageable parts, and a clutch protection device comprising an element mounted on one of the components of the electromagnetic means and situated adjacent to the other of the components across said gap, the narrowing of said gap beyond a predetermined value permitting contact between said element and other component, to complete an electrical circuit to produce a signal.

4,290,515

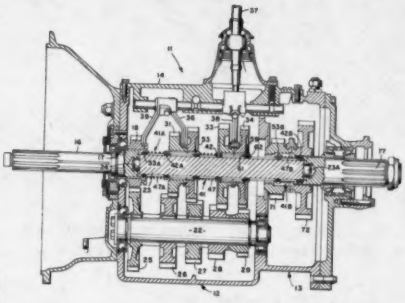
TRANSMISSION WITH RESILIENT SHIFTING MECHANISM

Edward J. Bogema, Vicksburg, and Elmer A. Richards, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 15, 1978, Ser. No. 934,102

Int. Cl.³ F16D *13/00*

U.S. Cl. 192—53 C **11 Claims**



1. An improved change speed transmission of the type comprising selectively axially movable gears having clutch teeth associated therewith, clutch collars mounted directly to a shaft by a spline connection for rotative motion with said shaft, said clutch collars carrying clutch teeth for selective engagement with the clutch teeth associated with said gears, the improvement comprising:

said spline connection comprising axially extending interengaged spline teeth formed on the outer surface of said shaft and on the inner surfaces of said clutch collars, the spline teeth on one of said clutch collars and said shaft being of a substantially constantly varying circumferential thickness along at least a portion of the axial extension thereof, said constantly variable thickness spline teeth arranged such that, in the nonengaged position of said clutch collars, the circumferential spacing between cooperating clutch collar and shaft spline teeth is smallest at the end of the clutch collars closest the gear with which it is associated.

4,290,516

TORQUE LIMITER

Jeffery L. West, Winchester, and Randy Berry, Sudbury, both of Mass., assignors to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Jun. 7, 1979, Ser. No. 46,448

Int. Cl.³ F16D *43/20*

U.S. Cl. 192—56 L **10 Claims**

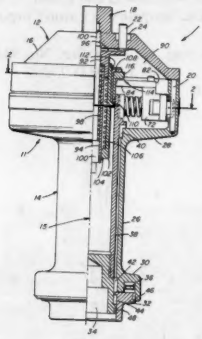
1. A device for applying a predetermined torque level to an object, said device comprising:

(a) a rotatable housing configured to be rotated by a driver, said rotatable housing having a series of evenly spaced dowel means disposed in a circular path about an interior surface thereof;

(b) torque means mounted within said housing, said torque means including driven member means having rollers configured to engage and to disengage adjacent ones of said dowel means, said torque means rotatable with said housing when said rollers and said dowel means are engaged, said driven member means including means for engaging the object to which the predetermined torque level is to be applied; and

(c) bias means mounted in said housing, said bias means

urging said rollers and said dowel means into engagement with a predetermined force, said dowel means and said



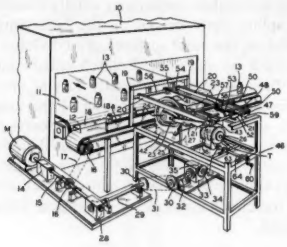
rollers disengaged when the torsional resistance on said driven member means exceeds said predetermined force.

4,290,517

METHOD AND APPARATUS FOR REDUCING LOADER BAR IMPACT

Harry C. Hafferkamp, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 29, 1978, Ser. No. 964,330
Int. Cl.[3] B65G *47/26*
U.S. Cl. 198—427 **2 Claims**



1. Apparatus for pushing a line of ware onto the infeed end of a lehr from a moving row of ware, in which a pusher bar is carried at the forward end of a generally rectangular frame and the frame is pivotally mounted at the other end, with a pair of motor-driven cams lifting the forward end of the frame in a predetermined cycle and a crank arm driven by the motor and connected to move the frame forward and backward;

a crank driven by the motor in parallel with one of the lift cams;

a stationary box cam having a path that circumscribes the axis of rotation of the driven cam and crank;

an elongated, generally radially extending slot formed in said crank;

a cam follower positioned in both the elongated slot and in the stationary box cam;

means pivotally connecting one end of the crank arm to said cam follower:

a horizontal shaft extending across the width of said frame at the rearward end thereof and rotatable relative thereto;

means pivotally connecting the crank arm to the shaft on said frame; and

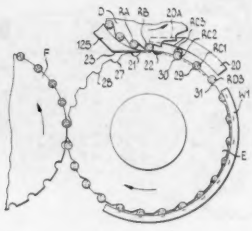
means drivingly connecting the sides of the frame together, whereby forward and backward movement of said frame is equally transmitted to both sides of said frame.

4,290,518

FILTER ATTACHMENT MACHINES

Derek H. Dyett; Ivan Y. Hirsh; Edward G. Preston, and Robert E. Williams, all of London, England, assignors to Molins Limited, London, England

Filed Aug. 3, 1979, Ser. No. 63,447
Claims priority, application United Kingdom, Aug. 3, 1978, 32143/78
Int. Cl.[3] B65G *29/00, 47/68*
U.S. Cl. 198—450 **10 Claims**



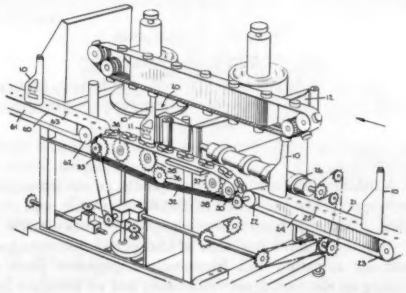
1. A device for use in a filter attachment machine for staggering and aligning filter portions cut from multiple-length filter rods, comprising a first fluted drum which conveys the cut filter rods to a second fluted drum having adjacent to it means including a rolling plate for rolling at least one portion of each filter rod into a staggered position with respect to another portion of the same rod and at least one stationary finger extending into a circumferential recess in the second fluted drum to hold adjacent filter portions out of the flutes until they have been rolled into staggered positions by the rolling plate, and means for displacing at least some of the staggered filter portions along the flutes of the second fluted drum to bring all the filter portions into alignment.

4,290,519

ARTICLE SUPPORT SYSTEM

Albert J. Harvey, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,317
Int. Cl.[3] B65G *47/00*
U.S. Cl. 198—483 **14 Claims**



1. An article support system adapted to engage and transport articles to be decorated through an article decorating station which comprises:

an endless conveyor having an input end and extending through said decorating station, said input end being gradually inclined towards the portion of said conveyor means extending through said decorating station;

means for driving said endless conveyor through said decorating station;

means for feeding articles to be decorated to said input end of said endless conveyor along a path generally parallel to the path of travel of said endless conveyor through said decorating station,

a plurality of spaced receptacles attached to said endless conveyor suitable for supporting the article to be decorated, each of said receptacles being contoured with a central recessed portion and upwardly extending edge portions, said contoured shape being in general conformance with the configuration of the bottom of the article to be decorated such that said receptacles are adapted to support the articles along a substantial portion of their lower peripheral shape, each of said receptacles being formed of two sections closely spaced to one another and separable along a line transverse to the path of travel of said endless conveyor so that said receptacle sections open away from one another when passing along a curved path, the inclination of said input end of said conveyor means and the separability of said two sections of said receptacles facilitating the sliding of the article to be decorated as fed by said feeding means into the path of travel of said endless conveyor and the engagement of the article to be decorated by said receptacle; and

means for attaching each half of said receptacle to said conveyor.

4,290,520

CONVEYOR BELT CLEANING DEVICE

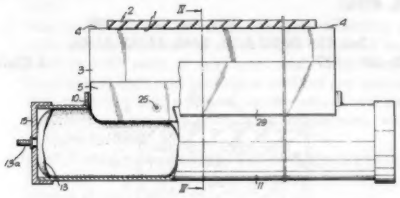
Ronald B. Rhodes, Retford, England, assignor to Salgar Supplies Ltd., England

Filed Oct. 18, 1979, Ser. No. 85,866

Claims priority, application United Kingdom, Oct. 20, 1978, 41356/78; Sep. 11, 1979, 31434/79

Int. Cl.³ B65G *45/00*

U.S. Cl. 198—499 **2 Claims**



1. A conveyor belt cleaning device comprising:

(a) an elongate scraper element having a longitudinal scraping edge which makes scraping contact with a surface of a conveyor belt to be cleaned, the scraper element having a longitudinally extending inner surface portion opposite to said longitudinal edge;

(b) a flexible-walled container the interior of which is pressurized for maintaining the said inner surface portion of the scraper in contact with the container and thereby maintaining the scraper element in contact with a conveyor belt surface to be cleaned;

(c) a housing enclosing the flexible-walled container and having a slot in which said scraper element is slidable;

(d) a debris shield structure interposed between the scraping edge of the scraper element and the housing and disposed on opposite lateral sides of the scraper element to prevent the ingress of dislodged debris from a conveyor belt being cleaned into the housing slot, said debris shield structure comprising support plates secured to the housing on opposite sides of the slot therein, the plates converging towards and making contact with opposite faces of the scraper element to support the scraper element laterally, externally of the housing, said support plates serving to deflect debris dislodged from the conveyor belt;

(e) the said surface portion of the scraper element in contact with the flexible-walled container having rounded edges and/or corners.

4,290,521

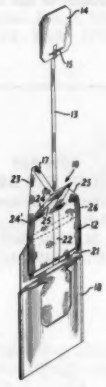
INFUSION PACKAGE AND METHOD OF MAKING SAME

Robert M. Mitchell, Norwalk, Conn., assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Sep. 10, 1979, Ser. No. 74,260

Int. Cl.³ A47G *19/16*; B65B *1/00*; B65D *85/00*

U.S. Cl. 206—0.5 **6 Claims**



1. An infusion package including a bag of liquid permeable material having a substantially large volume stable configuration enclosing a three-dimensional interior space containing a substance to be infused, at least one fold flattening the bag from said large volume stable configuration to a configuration of substantially descreased internal volume, and a pull means affixed to the bag in cooperation with the fold and defining, with said fold, means for expanding the bag to the large volume stable configuration.

4,290,522

SPECTACLE HOLDER

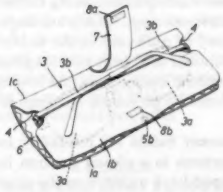
Takao Takasaki, No. 4920-2, Oaza Hirano, Nichinan-shi, Miyazaki-ken, Japan

Filed Sep. 20, 1979, Ser. No. 77,261

Claims priority, application Japan, Sep. 20, 1978, 53-129899[U]

Int. Cl.³ A45C *11/04*

U.S. Cl. 206—5 **4 Claims**



1. A spectacle holder comprising:

a generally rectangular flexible holder sheet having a width longer than that of a spectacle frame and consisting of a main section and a flap section interconnected by a folding line to be foldable toward each other and holding between said main and flap sections spectacle glasses with the top portion of the spectacle frame facing toward the folding

line, said main and flap sections defining longitudinal edges distal to the folding line;

notches formed in the opposite end portions of said flap section adjacent to the folding line to receive base end portions of bows of said spectacle frame, said opposite end portions of said flap section extending beyond said base end portions between the notches and the longitudinal edge of the flap section so that the spectacle frame is embracingly held on said flap section between the opposite notches when said bows are folded along the outer periphery of said flap section, thereby preventing the spectacles from slipping off of the holder sheet; and

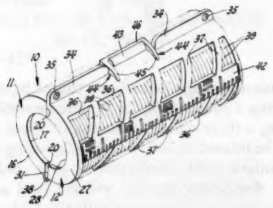
a cleaning cloth attached to the inner side of said holder sheet.

4,290,523

COIN HOLDER

James J. Wallace, Milpitas, Calif., assignor to Vacumet Finishing Inc., St. Clair, Mich.

Filed Mar. 24, 1980, Ser. No. 133,271
Int. Cl.³ B65D *8/04;* A45C *11/00;* B65D *25/54*
U.S. Cl. 206—0.82 **11 Claims**



1. A molded, polymeric, integral one-piece construction holder for coins, comprising:

(a) an elongated hollow cylindrical body having an internal circular cross-section of a diameter substantially that of a certain size coin to the retained in the holder, and which body includes two half-body portions, each having a semi-circular cross section;

(b) a continuous, elongated, integral living hinge member hingedly joining said half-body portions along an adjacent edge of each of said half-body portions;

(c) each of said half-body portions being provided with a longitudinal free edge and an integral partial end wall;

(d) one of the half-body portiona being formed with a plurality of geometric openings, which are disposed so that the outer periphery of each coin in the holder is visible, and which are disposed in at least two longitudinal rows, and with the geometric openings in one row being longitudinally offset from the geometric openings in the other row; and,

(e) integral fastener means for releasably locking the two half-body portions in a closed position including an inverted U-shaped latch member on the outer side of one of said half-body portions and extending tangentially from the longitudinal free edge thereof over the other of said half-body portions, and a lip fastener member on the other of said half-body portions and extended outward radially from the longitudinal free edge on said other half-body portion for releasable locking engagement with the latch member when the two half-body portions are swung to a closed position.

4,290,524

VIDEO MAGAZINE AND PACKAGE THEREFOR

Charles Azar, 4149 Bonita Ave., Coconut Grove, Fla. 33133

Filed Dec. 19, 1979, Ser. No. 105,348
Int. Cl.³ B65D *85/57, 85/671;* B42D *3/18*
U.S. Cl. 206—232 **6 Claims**

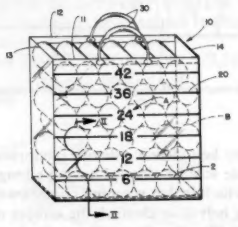
1. A video magazine for use with a video recording apparatus, comprising the combination of a video replay means having a series of indexable video programs thereon, and printed program means including a series of indica, each indicia corresponding to one of the series of indexable video programs on the video replay means whereby a user of the video magazine may, by referring to the printed program means, readily index the video replay means in the video recording apparatus, to the desired video program, including an integral packaging means accommodating said video replay means and said printed program means in a single unit, said packaging means comprising a first sleeve member receiving the printed program means, and a second sleeve member connected to an outer surface of said first sleeve member accommodating said video replay means, said second sleeve member including a cut-out portion and facilitating unloading of said video replay means, and retaining means secured to said outer surface of said first sleeve maintaining said video replay means within said second sleeve.

4,290,525

AUTOMATIC COUNT AND IDENTIFICATION CARRIER FOR REFUNDABLE CANS

Kimberley R. Sisson, 2300 Kent Blvd., N.E., Grand Rapids, Mich. 49503

Filed Sep. 17, 1979, Ser. No. 75,889
Int. Cl.³ B65D *5/36, 5/46, 33/02, 33/06*
U.S. Cl. 206—427 **1 Claim**



1. A reuseable carrier for transporting empty metal beverage containers of a uniform size and shape, said carrier having a generally flat base of a size and shape such that its length is slightly greater than a multiple of the diameter of one of the containers to be transported; a front panel, a rear panel and a pair of end panels, said front and rear panels being spaced apart just sufficiently to permit one of the beverage containers to be positioned lengthwise between them, said base, front panel, rear panel and end panels being formed of a liquid impervious and washable material; said end panels being spaced apart sufficiently to permit a plurality of the containers to be placed in side-by-side relationship lengthwise of the carrier; handle means for supporting said carrier; one of said front and rear panels being transparent; a plurality of vertically spaced lines on said one panel, said lines being spaced apart a distance equal to the vertical center to center spacing of the ends of the containers when they are arranged on their sides in tiers with one tier resting on the tier beneath; indicia displayed at each line indicating the cumulative number of containers in the

carrier when the tier of containers corresponding to the line is full to provide an automatic count of the container content of the carrier; and a rigid stiffener panel removably disposed on said base, said rigid stiffener panel being formed from a liquid impervious washable material, said end panels defining fold-lines positioned so that the front, rear and end panels may be folded around said stiffener panel.

4,290,526

PACKAGE, ESPECIALLY TUBULAR WRAPPER-TYPE CONTAINER WITH RE-USABLE CLOSURE, ESPECIALLY FOR CHOCOLATES OR CANDY

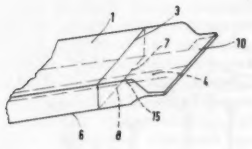
Manfred Haiss, Zeisigweg 17, 7035 Waldenbuch, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 76,068

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1979, 2840409

Int. Cl.³ B65D *5/54, 17/28*

U.S. Cl. 206—624 **15 Claims**



1. A package, especially tubular package for ice cream bars, candy bars, chocolate, and similar products including meltable articles such as ice, said package comprising in combination:

a substantially continuous body having a first end and a second end and a seal seam suitably located with said body;

at least at one end portion of said package including a tear-weakened section thereof extending around said package towards both sides of said seam and being adapted to break and to open said package at said last one end portion so as to expose only a part of the contents of said package protected against direct touching engagement with the contents thereof;

a hinge formed by a portion of said package extending over only part of periphery of the package for opening and closing thereof; and

a tongue pullable to apply transverse force that effects tearing of said tear-weakened section adjacent thereto.

4,290,527

SLUICE CONSTRUCTION

Winston F. Wright, 2660 Fair Cir., Reno, Nev. 89503

Filed Aug. 13, 1980, Ser. No. 177,796

Int. Cl.³ B03B *4/00, 5/06*

U.S. Cl. 209—12 **3 Claims**

1. In a sluice element for mineral recovery comprising a lower wall, a pair of side walls bordering the longitudinal edges of said bottom wall to define a sluice channel, and a plurality of riffles for separating the solids from a liquid slurry disposed intermediate said first and second ends thereof, the improvement comprising: each of said riffles including a vertical wall having a lower edge supported by said bottom wall and an upper edge terminating below the upper edges of said side walls, a second wall in sloped relation to said vertical wall having an upper edge connecting with said upper edge of said vertical wall, and a lower edge supported by said bottom wall, and terminating a distance from a next vertical riffle wall, said bottom wall having a rectangular opening therein of axial length corresponding to said last mentioned distance; a rectangular frame detachably associated wih said opening, and a plurality of screens in congruent relation supported by said frame to underlie said opening.

4,290,528

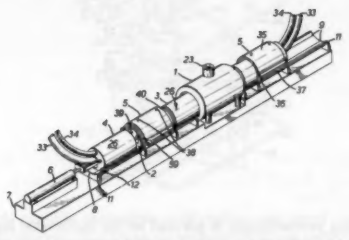
MAGNETIC SEPARATING APPARATUS WITH MEANS FOR BALANCING MAGNETIC FORCES

Zdenek J. J. Stekly, Hampshire Ct., Wayland, Mass. 01778

Continuation-in-part of Ser. No. 881,811, Feb. 27, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,218

Int. Cl.³ B03C *1/10*

U.S. Cl. 209—223 R **7 Claims**



1. Magnetic separator apparatus comprising:

means for establishing a magnetic field in a predetermined zone;

a separating chamber provided with an inlet and an outlet for fluid;

fluid-permeable and magnetisable packing material disposed within said separating chamber;

a compensating element incorporating ferromagnetic material, being adjacent and coupled to said separating chamber; and

means for moving said separating chamber and said coupled compensating element in a common direction to thereby move said separating chamber between a first position in which the separating chamber is within the predetermined zone and a second position in which the separating chamber is outside the predetermined zone, while simultaneously bringing said adjacent compensating element into said predetermined zone and displacing said separating chamber thereat;

said compensating element having a size and a distribution of ferromagnetic material therein such that the magnetic force tending to draw said element into said predetermined zone when it is moved into said zone by said moving means, substantially balances the magnetic force resisting displacement of said separating chamber when it is moved from said zone by said moving means; the said magnetic field thereby interacting with said compensating element as said element displaces said separating chamber at said predetermined zone, to generate balancing forces reducing the force required to move said separating chamber between its two said positions.

4,290,529

RACK FOR BOAT FENDERS

John H. Jones, 7540-155 Bay Island Dr., South, South Pasadena, Fla. 33707, and Lloyd P. Dewey, Canfield, Ohio, assignors to John H. Jones, South Pasadena, Fla.

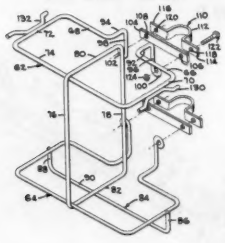
Filed Dec. 26, 1978, Ser. No. 972,943

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—13 **3 Claims**

1. A rack for a boat fender of the type having an elongate cylindric body from at least one end of which extends a protu-

berance that defines a line attaching opening and has a thickness dimension, a width dimension greater than the thickness dimension and an opening extending through the thickness of the protuberance, the fender rack comprising an open framework formed by a plurality of elongate rigid members including upper and lower members bent to define first upper and lower congruent openings shaped to snugly receive the fender therein, means for supporting said members in vertically aligned spaced apart relation and a U-shaped member having spaced apart vertical legs joined to at least said lower member and a horizontal member extending between said vertical legs below said lower member, said U-shaped member being offset from the center of the openings formed by said upper and lower members so that when the width dimension of said



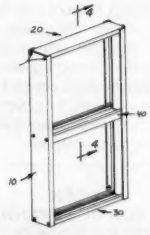
eye-forming protuberance is parallel to the horizontal leg the body of said fender is supported on said horizontal leg and so that when the fender is positioned so that the width dimension is oblique of the horizontal leg the eye-forming protuberance is supported on the horizontal leg, said rack also including upper and lower straps, each said strap having an arcuate portion adapted to circumscribe the vertical ship rail member and first and second tabs integral with and extending outward of the respective ends of said arcuate portion, said tabs being substantially coplanar with one another and defining tab holes therein, said upper and lower members forming fastener openings in registry with said tab holes, and threaded fasteners extendable through said fastener openings and said tab holes for retaining said straps in circumscribing relation to the vertical ship rail and for retaining said framework to said straps.

4,290,530

APPARATUS FOR STORING AND DISPLAYING RECORD ALBUMS

Kirk A. Wooster, 445 Bishop St. N.W., Atlanta, Ga. 30318

Filed Sep. 14, 1979, Ser. No. 75,407
Int. Cl.[3] A47F *7/00*
U.S. Cl. 211—40 **2 Claims**



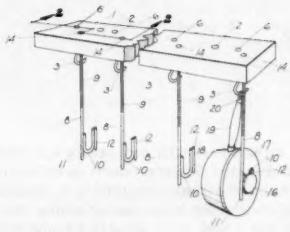
1. Apparatus for storing and displaying record albums of selected thickness and height comprising a plurality of frames and means for mounting said frames to a wall, and with each frame having an upright side wall from which at least two slide trays of widths substantially in excess of said record album thickness laterally extend in mutually parallel relation spaced one above the other a distance in excess of said album height, and a pair of upright supports mounted to the ends of said slide trays distal said upright side wall; and means for securing said frames together in a staggered formation with an upright support of one frame overlaying and being secured to a side wall of the other frame; whereby the plurality of frames may be mounted to a wall and sets of record albums slid between the pair of upright supports and stacked one behind the other on the slide trays for storage and display, members of each record album set sequentially slid partially back through the supports and partially off the slide trays to reveal record albums therebehind, and access provided to stacks of albums supported upon the trays of each frame.

4,290,531

DEVICE FOR HOLDING COOKING POTS AND LIDS

Fred Lazarus, III, c/o Federated Department Stores, Inc., 7 W. Seventh St., Cincinnati, Ohio 45202

Filed Oct. 15, 1979, Ser. No. 85,227
Int. Cl.[3] A47F *5/08*
U.S. Cl. 211—71 **10 Claims**



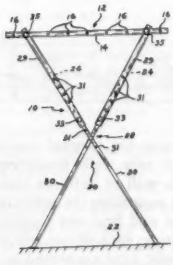
1. In combination in a holder for suspending a pot and its lid from an overhead support with the lid seated on the pot, a pot having a handle extending outwardly from one side thereof and a lid having a handle at its center, said holder comprising a first means for engaging and suspending said pot by its said handle, and a coacting second means for engaging and suspending said lid by its handle, said second means being positioned relative to said first means so as to hold the lid in seated position on said pot.

4,290,532

SUPPORT ASSEMBLY

Lawrence E. Reynolds, 1169 Garden Dr., New Port Richey, Fla. 33552

Filed Sep. 14, 1979, Ser. No. 75,807
Int. Cl.[3] A47F *5/00*
U.S. Cl. 211—200 **1 Claim**



1. A supplementary support assembly of the type primarily designed to simultaneously support a plurality of clothes lines,

said support assembly comprising: line engaging means disposed in supporting attachment with a plurality of parallel clothes lines comprising a substantially elongated bar element disposed in concurrent supporting engagement with the plurality of parallel clothes lines and oriented in substantially transverse relation to the longitudinal run of the plurality of clothes line, line attachment means formed on said elongated bar element and comprising a plurality of attachment elements, wherein each of the plurality of parallel clothes lines supported by said elongated bar element is in engageable relation with one of said attachment elements, said plurality of attachment elements comprise a plurality of apertures, each of said apertures is integrally formed in said elongated bar element in spaced apart relation to one another, each said plurality of apertures each disposed in surrounded disposition to one of the parallel clothes line, mounting means connected in supporting engagement with said line engaging means and disposed in interconnected relation between the ground and said line engaging means, said mounting means comprising at least two support elements, each said support element comprising two segments disposed in telescoping relationship relative to each other, each of said two segments including a plurality of apertures formed along the length thereof, corresponding segments of each of said two support elements being pivotally coupled by a pin extending through any corresponding said apertures of said corresponding segments, said two segments of each said two support elements being disposed in longitudinally movable relation relative to each other along the direction of the longitudinal axis of each said support element, each said support element varied in longitudinal dimension upon varying the position of said respective two segments, said corresponding segments being selectively locked relative to each other by pins extending through any corresponding said apertures, the upper portion of each said support element being coupled to said line engaging means by a pin extending through any one of said aperture formed on said elongated bar element such that the distance between said coupling is selectively varied, whereby the space between said line engaging means and the ground is varied upon selectively adjusting said longitudinal dimension, said pin extending through any of said corresponding aperture of said corresponding segments and said pins extending through any one of said aperture formed on said elongated bar element.

4,290,533

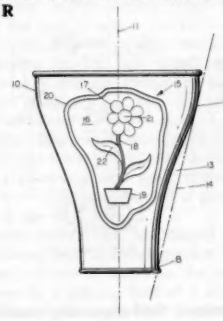
CERAMIC DECORATED GLASSWARE

Thomas F. Rupp, Sylvania, and Lowell J. Wells, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 809,951, Jun. 27, 1977, Pat. No. 4,143,183. This application Dec. 21, 1978, Ser. No. 971,971

Int. Cl.³ A47G *19/22*; G03C *7/00*

U.S. Cl. 215—1 R **8 Claims**



1. A glass container having an axis of rotation including a multicolor decoration on at least part of the exterior, said decoration comprising a halftone created image wherein the primary yellow glass enamel has a pigment content in the range of 10–20 percent, and the remaining primary color glass enamels have a pigment content in the range of 2–6 percent.

4,290,534

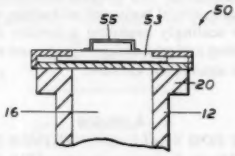
CANNULA PIERCEABLE SELF-SEALING CLOSURE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Division of Ser. No. 942,113, Sep. 13, 1978, Pat. No. 4,226,333, which is a division of Ser. No. 880,474, Feb. 23, 1978, Pat. No. 4,136,794, which is a division of Ser. No. 729,643, Oct. 5, 1976, Pat. No. 4,111,326, which is a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application May 8, 1980, Ser. No. 147,951

Int. Cl.³ B65D *47/36*

U.S. Cl. 215—247 **1 Claim**



1. A cannula pierceable, self-sealing gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises;

(a) a tubular elastomeric body having

(i) flexible, elastic sidewalls;

(ii) an open first end; and

(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls;

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end;

(c) a protective cap adhered to the outside of said closed second end;

(d) a puncturable diaphragm closing the open first end, and having inner and outer surfaces; and

(e) a removable disc covering the outer surface of the diaphragm;

said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;

whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

4,290,535

SEALING BUNG FOR BOTTLE CLOSURES

Erminia Reina, Milan, Italy, assignor to Alucaps Italiana S.p.A., Italy

Filed Dec. 6, 1979, Ser. No. 101,002

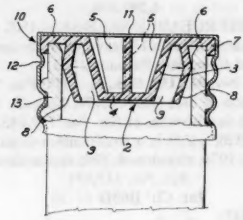
Claims priority, application Italy, Apr. 11, 1979, 21330/79[U]

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—270 **9 Claims**

1. An improved bung for use in sealing an opening of a container in combination with a closure for the container, the improved bung comprising an annular flange, an edge depending from the radially outer periphery of said annular flange, a

hollow central body depending from the radially inner periphery of said annular flange, said central body being cone-shaped, said central body having a closed smaller end remote from said annular flange and an open larger end, and a lip depending



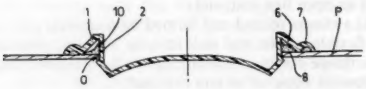
from said annular flange at a location intermediate and radially spaced from said central body and said edge, whereby said lip is adapted for sealingly engaging a surface of the container about the opening and said annular flange and edge are adapted for disposition against the closure.

4,290,536

CLOSURE FOR SEALING OPENINGS IN PANELS

Henri Morel, Maule, France, assignor to ITW de France, Beauchamp, France

Filed Mar. 27, 1980, Ser. No. 134,713
Claims priority, application France, Mar. 28, 1979, 79 07819
Int. Cl.³ B65D *41/00*
U.S. Cl. 220—359 **3 Claims**



1. A one piece plastic sealing plug device adapted to close and seal a complimentary aperture formed in panels, said plug being of the dished type having a bottom portion, a lateral encircling wall, external engagement means on said wall, a resilient head to be applied against the forward surface of the panel adjacent the edge of the aperture and ringlike thermofusible means disposed between the panel and said resilient head, said sealing plug device being characterized in that it includes resilient head means having a peripheral channel, said thermofusible means including a peripheral bead portion adapted to be captured within said resiliently urged channel and to be melted between said channel and panel upon application of an elevated temperature, whereby it is substantially retained under said head and caused to flow in its melted condition within the space that may occur between said sealing plug device and the aperture it is fitted in, whereby after colling such device becomes perfectly integral with said panel in said hole due to solidification of the thermofusible meas to the exact required shape without any loss of material regardless of the planarity and angular position in space said panel may assume.

4,290,537

VOLUME AND TEMPERATURE INDICATORS FOR INSULATED AIR POT

Lo Chi-Jung, No. 28, Lane 223, Lung Chiang Rd., Taipei, Taiwan

Filed Oct. 3, 1979, Ser. No. 81,318
Int. Cl.³ B67D *5/22*; G01F *13/00*
U.S. Cl. 222—25 **8 Claims**

1. An insulated portable air pot for dispensing liquid, comprising a pot body having an opening at the top, a detachable circular cap closing said opening of said pot and having and upper face, a liquid discharge pipe extending from said cap down into said pot body, and a discharge spout connected with the upper end of said discharge pipe, said cap having a compressible air chamber and a central push portion for compressing said air chamber to force air into said pot body and thereby force liquid up through said discharge pipe and out through said spout, arcuate volume indicating means in the upper face of said cap approximately concentric with said cap, arcuate

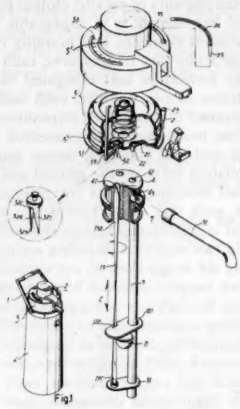


Fig.1

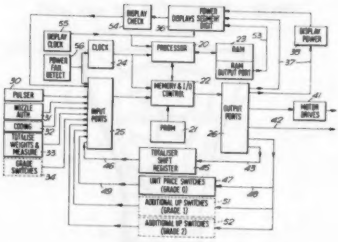
temperature indicating means in the upper face of said cap approximately concentric with said cap and opposite said volume indicating means, means in said pot for measuring the volume of liquid in said pot and detachable connecting means for transmitting said volume measurement to said volume indicating means, and means for transmitting the temperature of liquid in said pot to said temperature indicating means.

4,290,538

FUEL-DISPENSING SYSTEM WITH SELF-CHECKING MEANS

Roy L. White, Cambridge; David F. A. Leevers, St. Albans, and Peter W. Kitchin, Foxton, all of England, assignors to Dresser Europe S.A., Brussels, Belgium

Continuation of Ser. No. 732,476, Oct. 14, 1976, abandoned. This application Jan. 18, 1979, Ser. No. 4,316
Claims priority, application United Kingdom, Oct. 15, 1975, 42271/75
Int. Cl.³ B67D *5/08*; G06F *15/20*
U.S. Cl. 222—25 **18 Claims**



3. A self-contained fluid-dispensing machine comprising computer means including a processor within said machine; means within said machine responsive to a flow of fluid through said machine for measuring an amount of fluid as it is being dispensed, means responsive to said fluid measuring means for feeding information to the computer means relative to said amount of fluid dispensed and measured by the measur-

ing means; means in the computer means for calculating the cost of the measured amount of fluid in accordance with a predetermined unit price; means responsive to said fluid-measuring means for visibly displaying on said machine the amount of said fluid which is dispensed and the corresponding cost thereof; and self-checking means entirely within said machine for operating said computer means in order to continuously, positively and actively check the display means, said display checking means including means for monitoring a signal applied within said machine in order to operate an element in the display means on said machine, means for comparing an output from the monitoring means with a parity signal from the computer means in order to verify the operation of said machine, and means for applying an output signal from the comparison means to the computer.

4,290,539

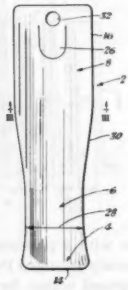
BOOT TOOL

Robert L. Lowery, 2115 8th St., Vero Beach, Fla. 32960

Filed Mar. 25, 1976, Ser. No. 670,580

Int. Cl.³ A47J *51/03*

U.S. Cl. 223—118 **3 Claims**



1. A boot tool for use in a boot with a long flexible sheath portion, a collar portion, an upper rim portion, a stiff heel portion and a lower heel all of which are connected together, the boot having a structure that extends from the top of said long flexible sheath portion, down through said collar portion of the boot and past said upper rim portion of said stiff heel portion of the boot, and ending near the upper inner surface of said lower heel of the boot, the boot tool comprising:

a single long generally uniform flexible body to allow conformity with the flexible portions of said boot,

said body including a lower rear heel portion with a lower end, a narrower collar portion sized for positioning against only the rear of said collar portion of said boot, and a sheath portion with an upper end for placement in boots of varying heights, said sheath portion sized to extend between a position above the top of said long flexible sheath portion of said boot to a position near said upper inner surface of said lower heel of said boot,

said body having a long longitudinal length for positioning it in boots with said lower end of said lower rear heel position near the top of said upper inner surface of said lower heel of said boot with the upper end of said sheath portion above the top rim of the boot,

said narrow collar portion sized and shaped to be positioned between said long flexible sheath portion of said boot and said stiff heel portion of said boot for opening up said collar portion by a passing foot of a user to allow the instep and heel of the user's foot to pass easily through said collar portion and past said upper rim portion of said boot without damaging the boot structure between the lower portion of said long flexible sheath portion and said upper rim portion of said boot, said narrow collar portion flexing to form a heel chute and designed to also flex into the shape of the normal distorted lower portion of said long flexible sheath portion of said boot as the user's foot moves through said collar portion, and said narrow collar portion positionable between and in contact with the heel of the user and the rear portion of said stiff heel portion,

said sheath portion connected to the said narrow collar portion for flexible use in contact along the inner length of said long flexible sheath of said boot,

said sheath portion conforming with the movement of said long flexible sheath portion as the heel of the user passes over said long flexible sheath portion, and

said sheath portion including a top portion connected near said upper end of said long flexible sheath portion of said boot for use over the top of said boot.

4,290,540

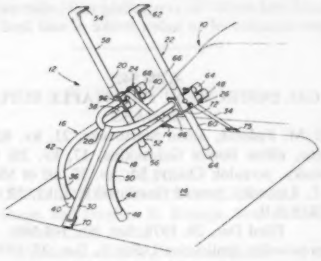
FOLDABLE BICYCLE CARRIER

Richard A. Allen, Bowles Ter., Lincoln, Mass. 01773

Continuation-in-part of Ser. No. 914,156, Jun. 9, 1978, abandoned, which is a division of Ser. No. 699,495, Jun. 24, 1976, Pat. No. 4,109,839. This application Jan. 10, 1980, Ser. No. 110,982

Int. Cl.³ B60R *9/10*

U.S. Cl. 224—314 **10 Claims**



1. A foldable carrier mountable on automobiles or the like, said carrier comprising:

(a) a pair of side members;

(b) a pair of carrying members, each said carrying member including a carrying arm and a body; and

(c) means for interconnecting said side members and said carrying members, each said side member and each said carrying member constrained for both slidable and rotational movement along and about parallel axes relative to said interconnecting means between extended and collapsed positions.

4,290,541

CONTROL SYSTEM FOR PNEUMATIC PUNCH PRESS FEEDERS

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Division of Ser. No. 20,174, Mar. 13, 1979. This application Apr. 25, 1980, Ser. No. 143,626

Int. Cl.³ B65H *17/36*

U.S. Cl. 226—150 **19 Claims**

1. A pneumatic feeder for intermittently advancing stock into the work station of a punch press or the like; comprising

a frame;

a feed slide reciprocally mounted on said frame;

stock gripping means mounted said feed slide;

fluid motor means for actuating said feed slide and stock gripping means through stock feed and index strokes;

main valve means for controlling the operation of said fluid motor means;

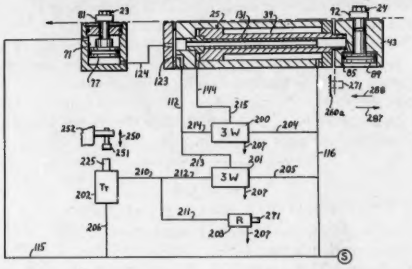
trigger means operative to control said valve means so as to cause initiation of a feed stroke of said feed slide;

said trigger means including;

a plunger means that is adapted to be movable between a

normal position and a depressed position in response to the operation of said press;

a pair of valves effectively coupled in series and each having a valving element associated therewith that is adapted to be displaced by the said movement of said



plunger means so that both of said valves are open during only a predetermined portion of the movement of said plunger means; and

reverse means operative in response to the terminal portion of said feed stroke for controlling said valve means so as to cause initiation of an index stroke of said feed slide.

4,290,542

SURGICAL INSTRUMENT FOR STAPLE SUTURING OF ORGANS

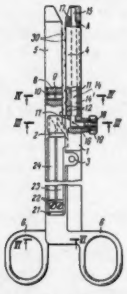
Vladimir M. Fedotov, ulitsa Startovaya, 21, kv. 42; Boris A. Smirnov, ulitsa Borisa Galushkina, 17, kv. 26; Genrikh I. Lukomsky, pereulok Chisty, 5A, kv. 35, all of Moscow, and Iosif L. Lipovsky, proezd Ozerkovsky, 7, kv. 32, Leningrad, all of U.S.S.R.

Filed Dec. 20, 1979, Ser. No. 105,860

Claims priority, application U.S.S.R., Dec. 25, 1978, 2714120

Int. Cl.[3] A61B *17/04*

U.S. Cl. 227—155 **2 Claims**



1. A surgical instrument for staple suturing of organs, comprising a supporting body, a staple body, a hinge joint for detachably articulating said supporting and staple bodies together, a jaw provided on the staple body and adapted for carrying removable staple magazines, the staple magazines accommodating staples for suturing and staple ejector means reciprocatingly mounted in the staple magazines for driving staples out of the magazines, a jaw having a lengthwise recess formed therein provided on the supporting body, a slidable member arranged in the lengthwise recess of said jaw of the supporting body for movement with respect to said supporting body so as to perform translating adjusting motion in a transverse direction with respect to the staple body for adjusting a gap between the slidable member and the staple body jaw, said slidable member having a surface thereof arranged parallel to the staple body jaw when the supporting body and staple body are in a stapling position, retainer means for fixing said slidable member in a preset position during adjusting motion thereof, recesses for bending staples formed in said slidable member, and actuator means for imparting adjusting motion to the slidable member wherein said actuator means comprises a crankshaft having journals held by the supporting body and a crank throw positioned between the journals, said slidable member having a slot formed therein to accommodate the crank throw, the crank throw being eccentric with respect to one of the journals so that rotation of the one journal results in translation of the slidable member by the crank throw.

4,290,543

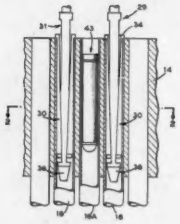
SUPPORT PLUG

Gordon C. Larson, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 6, 1977, Ser. No. 784,993

Int. Cl.[3] B23K *20/08;* F28F *9/14*

U.S. Cl. 228—2.5 **6 Claims**



1. In combination with a pressure vessel comprising tube sheet means transversely arranged therein, a plurality of fluid conveying tubes disposed within the vessel, the tubes having their ends connected to the tube sheet means, and including explosive activated plugs disposed for insertion into the ends of a leaky tube, means for detonating the explosive in the inserted plugs to fix the plugs to the surrounding tube walls thereby sealing the ends of the leaky tube, the improvement comprising means for supporting the tube sheet means and the ends of tubes adjacent to the leaky tube during detonation of the explosive, the supporting means including support plugs removably inserted into and bearing against the ends of said adjacent tubes.

4,290,544

APPARATUS FOR DEFORMING AN OBJECT AND SECURING IT TO A SUPPORT MEMBER

Jerome Grassin, Vanves; Maurice Thouvenin, Parmain, and Jean-Claude Epie, Montmorency, all of France, assignors to Saint Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 776,613, Mar. 11, 1977, Pat. No. 4,150,874. This application Mar. 13, 1979, Ser. No. 20,191

Claims priority, application France, Mar. 17, 1976, 76 07756

Int. Cl.[3] B23K *37/02, 37/04*

U.S. Cl. 228—7 **5 Claims**

1. Apparatus for forming a curvature in a deformable angle bar and for securing said bar to a support member which is rigid enough to hold said bar in the curvature to which said bar has been deformed, said apparatus comprising:

a first structure to which is secured the support member,

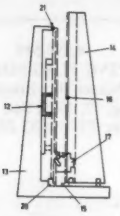
at least two spaced-apart thrust bearings designed to receive the deformable bar and hold it in proximity to said support member, said spaced-apart thrust bearings being oriented so as to support said deformable bar only at its ends so that said deformable bar is unsupported by said apparatus intermediate said thrust bearings,

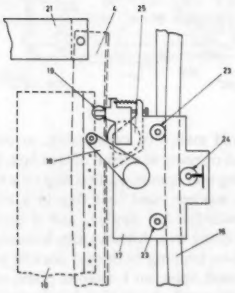
a track mounted on a second structure and having a curva-

ture that has the same shape as the curvature to which it is desired to deform the deformable angle bar,

a carriage mounted on said track and movable thereon through the curvature on said track,

means mounted on said carriage for bending said angle bar into the shape of the curvature of said track, said means comprising first and second rollers mounted at a fixed





distance from said track and positioned to grasp opposite surfaces of the angle bar, said rollers cooperating to bend the angle bar into substantial conformity with the curvature of said track as said carriage is moved along said track, and

means mounted on said carriage for attaching the deformable angle bar to the support member while it is being bent by said bending means.

4,290,545

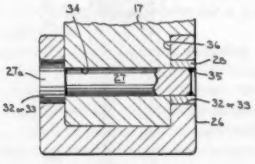
METHOD OF ATTACHING A PROTECTIVE CAP TO A SHREDDER COMPONENT

Richard P. Whitney, East Moline, Ill., assignor to Sivyer Steel Corporation, Milwaukee, Wis.

Division of Ser. No. 16,026, Feb. 28, 1979, Pat. No. 4,222,530. This application Apr. 24, 1980, Ser. No. 143,392

Int. Cl.[3] **B02C** *13/28*

U.S. Cl. 228—139 **4 Claims**



1. The method of attaching a protective cap to a shredder component without welding directly upon the cap or the component which comprises:

(a) providing a protective cap having a generally U-shaped channel with opposed walls for receiving a portion of the component desired to be protected, said opposed walls each having at least two openings extending therethrough with respective openings in opposed walls being aligned;

(b) providing the component with at least two openings which are aligned with the openings in the channel walls when the cap is in place said component openings being of less diameter than said channel wall openings;

(c) positioning the cap upon the component with the openings aligned;

(d) inserting pins through at least two of the aligned openings, said pins having a head at one end which is larger in diameter than the openings in the component but smaller in diameter than said channel wall openings, said pins being of sufficient length so that the pin extends through the aligned opening in the first wall of the cap, the opening in the component and into the opening in the second wall of the cap; and

(e) then positioning at least two washers each having an outer diameter greater than the openings in the component but smaller than the openings in the channel walls about a portion of the other end of the pin and welding it thereto so that the pin and washer combinations cannot be removed from the aligned openings and will retain the cap in position on the component.

4,290,546

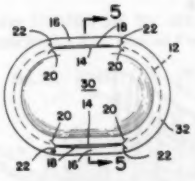
COVER FOR FOOD SERVING DISHES

Amos R. Kanaga, and Stephen R. Kanaga, both of 2300 Palm Ave., San Mateo, Calif. 94403

Filed Sep. 6, 1979, Ser. No. 73,020

Int. Cl.[3] **B65D** *5/64, 43/06*

U.S. Cl. 229—43 **4 Claims**



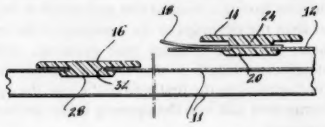
1. A cover for a food serving dish, said cover comprising a sheet of semi-rigid material selected from the group consisting of paper, paperboard, pressboard and plastic having transverse peripheral dimensions larger than corresponding transverse peripheral dimension of said dish, said dish having a pair of opposed arcuate peripheral edges of given length with the midpoints thereof spaced from each other by a given transverse peripheral dimension taken through the center of the area of said dish, said cover having a pair of substantially parallel rectilinear slits therethrough, said slits each having a length approaching said given length of said arcuate peripheral edges of said dish with the midpoints of said slits spaced from each other by a distance less than said given transverse peripheral dimension of said dish and corresponding ends of said slits being spaced from each other by a distance which is greater than corresponding transverse peripheral dimension of said dish on opposite sides of given transverse peripheral dimension of said dish, each said slit having an inwardly extending rectilinear extension at each end thereof forming an included angle of about 135° with respect to said slit.

4,290,547

RECLOSABLE ENVELOPE AND METHOD OF MANUFACTURE

John Sullivan, San Jose, and Harold R. Lillibridge, Burlingame, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

Filed Mar. 12, 1980, Ser. No. 129,556
Int. Cl.³ B65D *27/12*; B42F *1/00*
U.S. Cl. 229—77 **14 Claims**



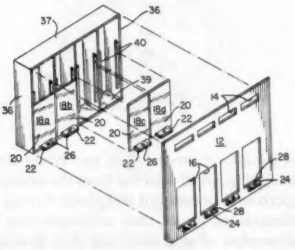
1. A reclosable envelope comprising:
an enclosed body portion hingedly connected to an overlying flap,
a first button connected to the outer surface of said flap,
a second button connected to the outer surface of said body portion, and
means for releasably connecting said first and second buttons to thereby releasably secure said overlying flap and said body portion,
said first and second buttons including
a base portion and at least one integral depending portion extending downwardly from said base portion through an opening in said flap and said body portion, respectively, of said envelope, said depending portion being flattened towards said base portion so that said buttons are permanently connected to said envelope.

4,290,548

HIGH SECURITY TAMPER-PROOF MAILBOX

Norbert J. Denhart, Cincinnati, Ohio, assignor to Elm Window Co., Cincinnati, Ohio

Filed Mar. 13, 1980, Ser. No. 130,111
Int. Cl.³ B65D *91/00*
U.S. Cl. 232—24 **4 Claims**



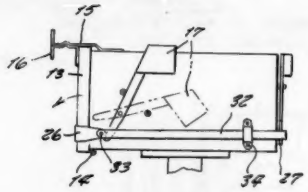
1. A security mailbox, comprising:
(a) a housing having a top wall, a bottom wall, a back wall and side walls;
(b) a plurality of spaced partition members extending from said back and bottom walls toward said top wall in parallel relationship to said side walls, said partition members dividing said housing into a plurality of compartments;
(c) a face plate in the form of a solid sheet securely affixed to the housing, said face plate being apertured in correspondency to said compartments, the outer edges of the face plate extending beyond the vertical and horizontal limits of the housing;
(d) retaining means securely fixed to the partitions on each side of the interior compartments and to a partition member and a side wall of the outermost compartments, said retaining means being spaced from the face plate by a predetermined distance and cooperating with said face plate to form channels therebetween;
(e) closure members slidably movable within said channels, said closure members being operative to close said apertures in a first position and being slidable to a second position which at least partially opens said apertures; and
(f) means for securing said closure member in said first position.

4,290,549

SELF-DROPPING FLAG FOR MAIL BOXES

John Getz, Jr., 2014 Naomi Dr., Brooksville, Fla. 33512

Filed Aug. 17, 1979, Ser. No. 67,388
Int. Cl.³ A47G *29/12*
U.S. Cl. 232—35 **1 Claim**



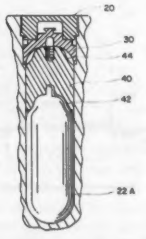
1. An improved mail box, comprising, in combination, an elongated box, an opening at a front of said box, a door pivoted to said box closing said opening, a first flag on a side of said box for signalling a resident; said first flag in a cocked position being raised upwardly for display, and a second flag in a cocked position being in a downwardly lowered, stored position, and said door tripping both said cocked positions when said door is pivoted open; an L-shaped plate, secured to said door, holding a flagstaff of said first flag from pivoting, and a sliding bar, attached to said plate, abutting against said second flag, retaining a flagstaff thereof from pivoting about a rivet secured to a rear wall of said box and extending through an intermediate portion of said flagstaff while an upward extending end of said flagstaff has a weight affixed thereto for being gravity activated for pivoting said flagstaff.

4,290,550

MODULAR SUPPORTING CAP AND SPACER FOR CENTRIFUGE TUBES

Steven J. Chulay, Los Altos, and Francis D. Richards, Sunnyvale, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 19, 1980, Ser. No. 122,214
Int. Cl.³ B04B *15/00*
U.S. Cl. 233—26 **10 Claims**



1. For use as a pressure-resisting cap above a sealed tube mounted in an upwardly opening cavity in a centrifuge rotor, the upper surface of said tube having a convexly shaped center

portion projecting upwardly in the cavity, a modular cap adapted to engage the top of the tube and having a sliding fit in the cavity;

the lower surface of the cap having a concave center portion adapted to mate with the convex center portion of the upper surface of the tube; and

the upper surface of the cap having a convex center portion adapted to mate with a concave center portion of a lower surface of a substantially identical cap.

4,290,551

AUTOMATIC TEMPERATURE COMPENSATED BOILER THERMOSTAT

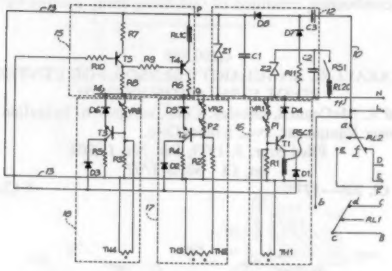
Frank Johnstone, Glasgow, Scotland, assignor to Carco Accessories Limited, Glasgow, Scotland

Filed Nov. 27, 1979, Ser. No. 97,829

Claims priority, application United Kingdom, Nov. 30, 1978, 46749/78

Int. Cl.³ F24D *5/10, 3/00*

U.S. Cl. 236—9 R **15 Claims**



1. A control apparatus for a fuel fired central heating boiler providing circulating heating water for space heating comprising:

a first temperature control circuit for controlling the firing of said boiler and the temperature of said circulating heating water including a first temperature sensitive element for sensing an external ambient temperature and a second temperature sensitive element for sensing the temperature of said circulating heating water, said first and second temperature sensitive elements being connected in series and having different resistance/temperature characteristics from one another such that a change in said external ambient temperature corresponds to a greater change in the temperature of said circulating heating water and determines a maximum slope of temperature change within said circulating heating water for a given external ambient temperature;

a second temperature control circuit including a third temperature sensitive element for sensing the temperature in a space to be heated and in response thereto for controlling the firing of said boiler and the circulation of said circulating heating water and arranged to determine automatically the slope of the temperature change within said circulating heating water below said maximum slope; and

an output circuit for controlling the firing of said boiler coupled to both said first and second temperature control circuits and adapted to be responsive to said first temperature control circuit and/or said second temperature control circuit.

4,290,552

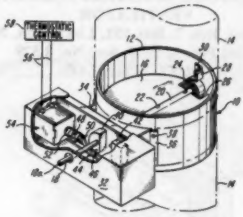
DAMPER CONTROL MECHANISM

John Prikkel, III, 2952 Ensley Ave., Dayton, Ohio 45414

Filed Aug. 14, 1980, Ser. No. 178,164

Int. Cl.³ F23N *3/00*

U.S. Cl. 236—1 G **10 Claims**



1. In a damper control mechanism of the type comprising a damper movable from a first position substantially closing a duct to a second position substantially opening said duct, yieldable means for biasing said damper to one of said first and second positions, motive means energizable to drive said damper against the bias of said yieldable means toward the other of said positions, and said duct having stop means for stopping said damper in one of said first and second positions, the improvement comprising thermally responsive means disposed in said duct and engaged to one of said damper and said stop means, said thermally responsive means having tab means engagable with the other of said damper and said stop means, said thermally responsive means exposed to matter passing through said duct for modulating the movement of said damper in response to the bias of said yieldable means.

4,290,553

ROTARY KNOB FOR THERMOSTATIC VALVES OF RADIATORS

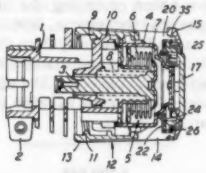
Aage Molgaard, Nordborg, and Niels P. G. Graversen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Denmark

Filed May 13, 1980, Ser. No. 149,498

Claims priority, application Fed. Rep. of Germany, May 28, 1979, 2921522

Int. Cl.³ F24F *11/06*

U.S. Cl. 236—42 **5 Claims**



1. A thermostatic control assembly for radiator valves, comprising, a chassis member adapted to be attached to a valve casing, said chassis having an index marking, a generally cylindrically shaped knob surrounding said chassis member, said knob having index marking which is related to said index marking on said chassis, thread means between said knob and said chassis member to facilitate axial movement for said knob, a thermostatic operating unit disposed internally of said knob and attached thereto, said operating unit having an axially movable valve actuating rod, an end cap, said end cap and said knob having internal serrations for coupling purposes, a ring member for adjustably attaching said cap to said knob, said ring member having circumferentially arranged sets of rigid and resilient teeth engaging said serrations, said resilient teeth

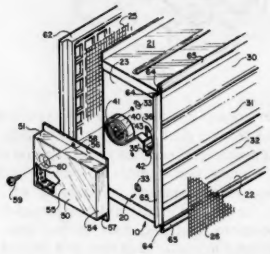
allowing relative rotatable adjustments between said knob and said cap without relative axial movement therebetween to allow adjustments involving said index markings of said chassis member and said knob.

4,290,554

TEMPERATURE ACTUATED FOUNDATION VENTILATOR

Robert C. Hensley, Rte. 7, Box 551, Lincolnton, N.C. 28092

Filed Feb. 1, 1979, Ser. No. 8,529
Int. Cl.³ F24F 7/00
U.S. Cl. 236—49 **2 Claims**



1. In a ventilator having a frame including a pair of opposed walls and a plurality of louvers extending between and pivotally connected to the opposed walls, actuating means pivotally connected to the louvers, a bi-metallic element responsive to changes in temperature to expand in hot weather and contract in cold weather, outwardly opening bifurcated means connecting one end of the bi-metallic element to the frame, means connecting the other end of the bi-metallic element to the actuating means to cause the louvers to open and close in response to movement of the bi-metallic element, the combination of a protective cover connected to the frame and extending about the bi-metallic element and comprising a top wall, a bottom wall, a front wall, a rear wall and a side wall, said cover being dimensioned such that said bi-metallic element remains out of physical contact with said cover during the expansion and contraction of said bi-metallic element, and said front wall and bottom wall each having a plurality of apertures therethrough establishing communication between the bi-metallic element and the ambient temperature and exposing the bi-metallic element to the ambient temperature, the remaining walls of said protective cover protecting the bi-metallic element from contamination by wet mortar, insects and dirt, and a dimpled portion extending inwardly from the said side wall of the said protective cover and registrable with outer open end of said bifurcated means connecting the said one end of the bi-metallic element to said frame to retain the bi-metallic element on the bifurcated means.

4,290,555

METHOD FOR SUPPLYING POWDER TO BE USED IN HOME SPRAY COATING OPERATION

Toshio Suwa, Tokyo; Yoshiaki Konagaya, Yokohama, and Hiroshi Ishii, Tokyo, all of Japan, assignors to Nippon Sanso K. K., Minato, Japan

Filed Feb. 15, 1980, Ser. No. 122,065
Claims priority, application Japan, Feb. 21, 1979, 54-19444
Int. Cl.³ B05D 1/10
U.S. Cl. 239—8 **4 Claims**

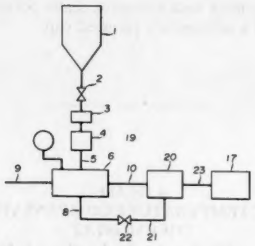
1. A method for supplying powder material to a flame spray coating burner by means of an ejector having a suction chamber therein, which comprises:

introducing a gas as jet gas into the ejector;

introducing powder material into the suction chamber, said jet gas drawing and carrying the powder material to form a gas-solid stream;

separating part of the gas from the gas-solid stream by means of a gas-solid separator;

introducing said part of said gas separated from the gas-solid stream into the suction chamber as suction gas;



controlling the rate of introduction of said suction gas into said suction chamber, thereby controlling the pressure in said suction chamber and the rate at which powder material is introduced therein; and

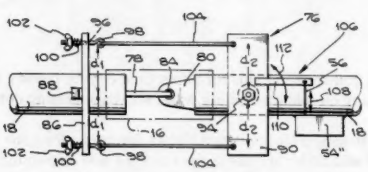
conveying part of the gas-solid stream which is not separated to a flame spray coating burner while maintaining a combustion condition of said flame spray coating burner.

4,290,556

PARALLEL ANGULARITY SENSOR FOR CENTER PIVOT IRRIGATION SYSTEM

Lloyd A. McConnell, Greeley, Colo., assignor to Irrigation and Power Equipment, Inc., Evans, Colo.

Filed Mar. 2, 1979, Ser. No. 16,804
Int. Cl.³ B05B 3/02
U.S. Cl. 239—177 **6 Claims**



1. In a center-pivot irrigation system having a plurality of interconnected span units revolving in articulated relationship about a center pivot with each span unit comprising a water-carrying conduit supported on one end by a wheeled support tower driven by a motor under the control of a control unit having a moveable input connected to be responsive to the angular deviation in a horizontal plane between the span unit having the motor and the next adjacent span unit, the improved angularity sensor providing an angularity signal to the controller comprising:

(a) a first horizontal rigid bar member attached adjacent one end of the span unit conduit to extend normal to the longitudinal axis of said one span unit conduit equally in opposite directions in the horizontal plane when said one span unit is revolving in a horizontal plane;

(b) a second horizontal rigid bar member rotatably attached at its center adjacent the abutting end adjacent said first rigid bar of the next adjacent span unit conduit to said one span unit conduit for rotation in said horizontal plane and extending normal to the longitudinal axis of said next adjacent span unit conduit equally in opposite directions in said horizontal plane;

(c) a pair of first connecting means for pivotally intercon-

necting respective ends of said first and second horizontal bar members extending from said span unit conduits in the same direction, said first connecting means holding said first and second horizontal bar members under substantially equal tension forces on each side and being extensible and retractible under equal tension forces; and,

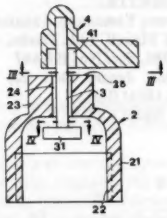
(d) second connecting means for interconnecting said second rigid bar member to the movable input of the controller to move the input in proportion to rotational movement of said second bar member corresponding to changes in angular deviation between said two adjacent span units.

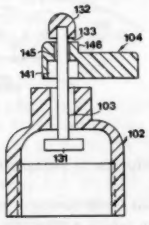
4,290,557

SPRINKLERS

Avner Rosenberg, Moshav Beit Shearim, Israel

Filed Feb. 25, 1980, Ser. No. 124,220
Int. Cl.³ B05B *3/04*
U.S. Cl. 239—222.21 **9 Claims**





1. A sprinkler comprising:

a nozzle connectable to a pressurized-liquid supply pipe and formed with an axial bore having an inlet end for inletting the liquid from the supply pipe and an outlet end through which the liquid exits in the form of a jet;

a spindle extending through the bore and projecting outwardly of the outlet end thereof, said spindle including means for retaining same within the bore but having a smaller outer diameter than the diameter of said bore so as to be laterally movable within said bore;

and a deflector mounted on said spindle and having a recess facing, and slightly larger than, the outlet end of said nozzle bore so as to be impinged by the jet issuing from the nozzle and thereby to impart rapid lateral movements to the spindle causing the spindle to impact against the sides of the bore;

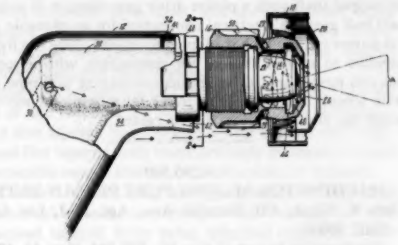
characterized in that said deflector is eccentrically mounted on said spindle, and said recess is formed eccentrically of said deflector, such that the impacts of the spindle against the sides of the bore impart a rotary movement to the deflector during impingement of the jet on the deflector.

4,290,558

FUEL NOZZLE WITH WATER INJECTION

Robert E. Coburn, Mansfield Center; Ronald M. Gabriel, Glastonbury, and Richard S. Tuthill, Bolton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 18, 1979, Ser. No. 76,638
Int. Cl.³ B05B *7/10*
U.S. Cl. 239—400 **3 Claims**



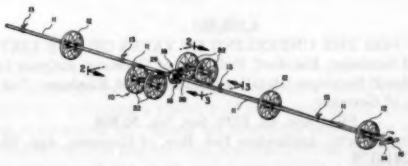
1. Apparatus for reducing smoke emissions exhausting from a gas turbine engine during water injection mode of operation, including a nozzle support having a generally cylindrically shaped body, a nozzle supported at one end thereof, an aperture in one end of said nozzle for injecting fuel centrally of said nozzle in a conical array, said conical array having an apex, a nozzle nut threadably supported on one end of said nozzle support, said nozzle nut having a generally conically shaped end portion surrounding a central opening concentric to said nozzle from which said apex of said conical array of fuel is formed, means for leading water through a plurality of drilled passages spaced about the circumference of said nozzle nut into a generally annularly shaped passageway formed between the inner diameter of said nozzle nut and the outer diameter of said nozzle and communicating with said central opening, an annular recess having a radially outwardly extending bore at one end of said annularly shaped passageway remote from said passages formed in the inner diameter of said nozzle nut for collecting water admitted into said annularly shaped passageway and also having a conically shaped wall radiating from a larger diameter at the extreme radial position of said bore to a smaller diameter adjacent said central opening, whereby the water collected in said recess is discharged about the entire circumference of said opening in a spray of small droplet size.

4,290,559

END CONTROL, ELECTRICAL, POWER DRIVE UNIT FOR AGRICULTURAL SPRINKLER IRRIGATION SYSTEMS

Russel Mayer, P.O. Box 811, Milford, Utah 84751

Filed Jan. 10, 1980, Ser. No. 110,931
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—716 **5 Claims**



1. An electrical, end control, power drive mover unit for agricultural sprinkler irrigation systems, comprising a wheeled frame having a pipe section of an irrigation sprinkler pipeline rotatably mounted thereon substantially parallel with the axes of rotation of the wheels thereof; a bull gear rigidly affixed to said frame and encircling said pipe section; dual, mutually substantially symmetrically oriented, structurally separate

platforms rigidly attached in mutually parallel relationship to and supported by said pipe section in diametric opposition to each other and adjacent to said bull gear; structural means rigidly affixing said platforms in common to said pipe section, said structural means comprising an annular disc plate encircling the pipe section at a side of said platforms and rigidly affixed thereto; electric motor and speed reducing gear box sets mounted on the respective platforms in mutually substantially symmetrical orientation, the gear box of each set having an output shaft with a pinion drive gear thereon in mesh with said bull gear; an electrical connection for an elongate electrical power cable which is adapted to extend along the irrigation pipeline to an end thereof for connection with a source of electric power; and drive means connecting said pipe section with wheels of said wheeled frame for moving the mover unit when the electric motors are energized.

4,290,560

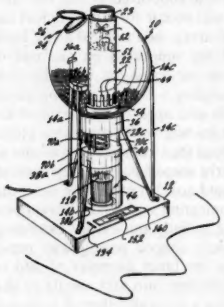
MACHINE FOR MAKING PURE PEANUT BUTTER

Victo V. Tabah, 431 Burnside Ave., Apt. 11-J, Los Angeles, Calif. 90036

Continuation-in-part of Ser. No. 959,593, Nov. 13, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 70,139

Int. Cl.³ B02C *7/04*

U.S. Cl. 241—65 **11 Claims**



1. In a machine for grinding nuts for producing nut butter, in combination, vertically oriented means for holding a supply of nuts to be ground, grinding means, including horizontal grinding discs, one of which is rotated relative to the other, vertically oriented screw means for delivering the nuts to be ground into central opening means in the grinding discs, the discs having relatively movable grinding teeth positioned to cause the nuts being ground to move outwardly radially between the grinding discs to the periphery of the discs, and the lower disc being rotated, means for causing all of the ground material, after being ground and passing outwardly of said discs, to be moved inwardly toward the central axis of the discs below said lower disc.

4,290,561

REEL FOR THE UNREELING OF TAPES OR THE LIKE

Roland Satzinger, Euerdorf, Fed. Rep. of Germany, assignor to Gebhardt Satzinger Metallwarenfabrik, Bad Kissingen, Fed. Rep. of Germany

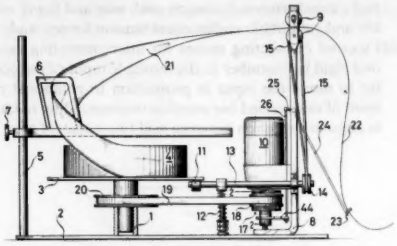
Filed Apr. 16, 1979, Ser. No. 30,508

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816179

Int. Cl.³ B65H *75/02;* **B21C** *47/16*

U.S. Cl. 242—55 **10 Claims**

1. An apparatus for unreeling tapes and the like from reels which apparatus comprises a reel plate driven by a driving motor, said driving motor having a driving shaft provided with a driven wheel, said driven wheel connected via a transmission to a driving wheel, said driving wheel connected via a shaft to said reel plate, said driven wheel connected to a clutch, said clutch connected to an actuating feeler, said feeler engageable by tape unwound from a reel disposed on said reel plate



whereby when said feeler is engaged said clutch is engaged to transmit rotation of said driven wheel to said driving wheel through said transmission.

4,290,562

HUB FOR USE IN A MAGNETIC RECORDING TAPE CASSETTE

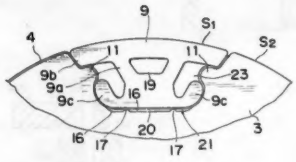
Shigeo Sasaki, Kyoto, and Osamu Yamamoto, Takatsuki, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 20, 1980, Ser. No. 198,647

Claims priority, application Japan, Oct. 20, 1979, 54-145412[U]; Oct. 20, 1979, 54-145413[U]

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—74 **8 Claims**



1. A hub for use in a magnetic recording tape cassette which comprises

an annular body having a cylindrical outer peripheral surface on which a magnetic recording tape is wound,

an engagement recess defined in the outer peripheral portion of the annular body and

a clamp piece fitted in the engagement recess, wherein

said engagement recess comprising an entrance opening formed in the cylindrical outer peripheral surface of the annular body, a pair of protrusions protruded inwardly of the recess to define a first space narrower than the width of the entrance opening on the intermediate portion of the both lower side walls of the engagement recess and an inner recess defined by a bottom face of the engagement recess and the both side walls thereof with a second space wider than the first space,

said clamp piece comprising a top portion having an arcuated surface with the substantially same curvature as the cylindrical outer surface of the annular body and with such a length in a circumferential direction that the top portion closes the entrance opening, a bottom portion having a pair of lugs protruding substantially towards the top portion from the both sides of said bottom portion with such a length that, when the clamp piece is fitted in the engagement recess, the lugs are engaged with the lower side walls of the recess and an intermediate portion for connecting the top portion and the bottom portion, whereby when said clamp piece is fitted in the engage-

ment recess with the magnetic tape inserted therebetween, the magnetic tape is secured on the hub in such manner that the magnetic tape is clamped between the ends of the lugs and at least one of the side walls of the engagement recess.

4,290,563

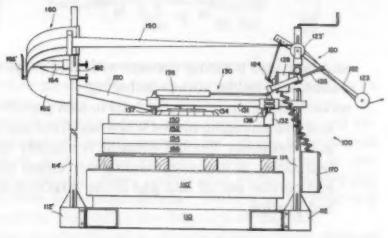
METHOD AND APPARATUS FOR DISPENSING COILED MATERIALS

Dannie L. Brooks, Red Lion, Pa., and Ronald S. Fields, Manakin, Va., assignors to Reel-O-Matic Systems, Incorporated, Wrightsville, Pa.

Continuation of Ser. No. 92,104, Nov. 7, 1979, Pat. No. 4,249,705. This application May 14, 1980, Ser. No. 149,718

Int. Cl.³ B21C *47/16*

U.S. Cl. 242—78.6 **14 Claims**



1. A method of dispensing flexible material from unconfined coils, each coil having an open inner eye, a method comprising the steps of:

(a) setting at least one coil upon an upright turntable;

(b) conformably engaging the inner eye of said coil with an expandable core; and, concurrently therewith,

(c) engaging the outer periphery of said coil with a roller to apply radial compression thereto;

(d) drawing the flexible material from said coil.

4,290,564

SPRING-OPERATED REVERSABLY ROTATABLE BODY

Hans I. R. Karlsson, Vintervagen 17, 175 40 Jarfalla, Sweden

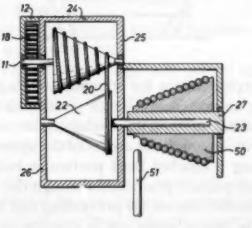
Division of Ser. No. 517,676, Oct. 24, 1974, Pat. No. 3,997,126. This application Nov. 9, 1976, Ser. No. 740,269

Claims priority, application Sweden, Oct. 30, 1973, 14694/73

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107 **5 Claims**



1. A spring operated winding device which comprises in combination:

(a) a rotatable output shaft that is mounted so that it is reversibly rotatable, and a reversibly rotatable input shaft mounted parallel to said rotatable output shaft,

(b) an elongated flexible member disposed concentrically around said rotatable output shaft so that when said rotatable output shaft is rotated in one direction said flexible member is in a wound condition and when said rotatable output shaft is rotated in the opposite direction said flexible member is in an unwound condition,

the surface of said output shaft upon which said elongated flexible member is disposed having a tapered configuration, said elongated flexible member forming one layer on said surface and being unwound from the top towards the base of said surface,

(c) a spring member having one end connected to said reversibly rotatable input shaft, said spring member being arranged to be stretched by the rotation of said output shaft during the unwinding of said elongated flexible member from said output shaft,

(d) means interconnecting said rotatable input shaft with one end of said rotatable output shaft, said means including

(1) a first tapered body having a base portion and a top, said first tapered body being drivingly connected to said rotatable output shaft in both directions of rotation,

(2) a second tapered body having a base portion and a top mounted on said rotatable input shaft, the taper of said second tapered body being disposed opposite to the taper of said first tapered body,

(3) a traction wire having one end attached to said base portion of said first tapered body, the other end attached to said base portion of said second tapered body, and the intermediate portion wound around the exterior surfaces of said first and second tapered bodies so that the rotation of the rotatable output shaft in one direction results in winding of the traction wire around said first tapered body and a stretching of said spring member so that said rotatable output shaft can then be caused to rotate in the opposite direction by releasing the tension of said spring member,

whereby the slope of the generatrix of said tapered bodies is such that the tractive force required to unwind said flexible member from said rotatable output shaft will be equalized over the course of said unwinding.

4,290,565

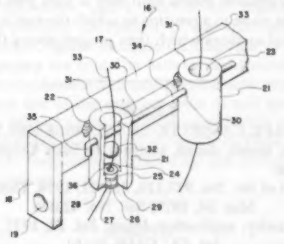
YARN TENSION DEVICE

Leonard R. Smith, 721 Green St., Raeford, N.C. 28370

Filed Mar. 13, 1980, Ser. No. 130,094

Int. Cl.³ B65H *59/22*

U.S. Cl. 242—152.1 **5 Claims**



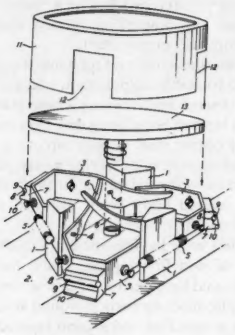
1. A device for use in conjunction with a textile type machine for tensioning a plurality of yarns, said device comprising: a mounting bar; means for mounting said bar for use in conjunction with said machine; a plurality of cup means fixedly secured to said bar; each cup means having a centrally disposed chamber therein through which a yarn is threaded and in which a tension applying ball is disposed; and an elongated ball retaining means extending through said plurality of cup means and across one end of the chambers of said plural cup means for retaining said balls within said chambers during threading of the yarns therethrough as well as during machine operation.

4,290,566

MAGNETIC TAPE HANDLER

John Knott, Wells, and Robert V. Elliott, Westbury-sub-Mendip, both of England, assignors to EMI Limited, Hayes, England

Filed Dec. 10, 1979, Ser. No. 101,860
Claims priority, application United Kingdom, Dec. 15, 1978, 48667/78
Int. Cl.³ B65H *59/38, 63/02*
U.S. Cl. 242—189 **16 Claims**



12. A reel mounting device for supporting a reel having an internal support surface comprising,

(a) a base plate,

(b) at least three symmetrically disposed support means mounted to the base plate,

(c) a mounting member, pivotally supported between, and mounted to, each pair of adjacent support means each mounting member including an end member having a resilient peripheral surface and a lever arm extending from one pivot point substantially towards another support member, and

(d) means for resiliently coupling each said member to an adjacent member outside the pivot points,

wherein an introduced reel urges the end members into a hold position in which said peripheral surfaces frictionally engage the internal support surface of the reel and the base plate supports each end member, and the device has a release member adapted to urge the arms towards the base plate against the action of the resilient means until they at least pass through the said common plane to a position in which the reel is not held by the peripheral surfaces which then project above the common plane.

4,290,567

TAPE CASSETTE BRAKE ASSEMBLY

Kenzo Saito, Izumi, Japan, assignor to Sony Corporation, Tokyo, Japan

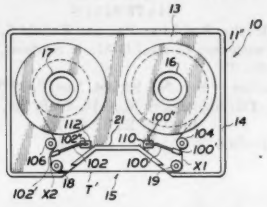
Continuation of Ser. No. 927,129, Jul. 21, 1978. This application May 24, 1979, Ser. No. 42,044
Claims priority, application Japan, Jul. 22, 1977, 52-97064
Int. Cl.³ G11B *23/10*
U.S. Cl. 242—198 **19 Claims**

1. In a cassette for use in a magnetic recording and/or reproducing apparatus and which is of the type having a housing containing rotatable reels having magnetic tape wound thereon with said tape extending between said reels being guided to direct a run thereof across an access opening in said housing, the improvement comprising:

support element means fixedly mounted to said housing adjacent one of said reels for sliding contact with a portion of said tape disposed between said adjacent reel and said access opening;

a resiliently flexible element including a fixed end portion and a free end portion, said first resiliently flexible element having first engaging means on said fixed end portion; and

holder means defining a gap for allowing said resiliently flexible element at said fixed end portion to be slidably disposed in said gap, said holder means being disposed in said housing adjacent said support element means such that said free end portion normally urges said portion of



said tape into pressing contact with said support element means, said holder means including,

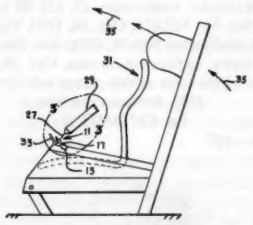
second engaging means disposed in said gap for engaging said first engaging means when said fixed end portion of said resiliently flexible element is slidably disposed in said gap so as to prevent sliding movement of said fixed end portion out of said gap in the direction of said free end portion.

4,290,568

AIRCRAFT EJECTION SEAT SAFETYING DEVICE

Philip K. Vollmoeller, Riverhead, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 9, 1979, Ser. No. 92,818
Int. Cl.³ B64D *25/10*
U.S. Cl. 244—122 A **2 Claims**



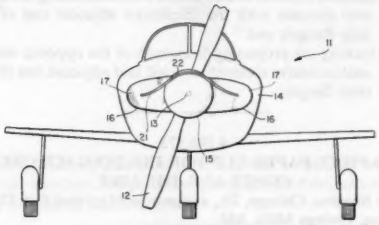
1. A safetying device for attachment to an aircraft ejection seat having an arm/dearm lever positioned thereon, said device comprising an inverted U-shaped base member having a clearance hole through the center of the upper portion thereof, a bolt having a knurled head portion, a body portion and a threaded end portion positioned through the clearance hole in said base member, means for preventing said bolt from separating from the device when not in position on the seat, an upstanding brace portion extending upward at an angle adjacent to the arm/dearm lever on the ejection seat to prevent accidental arming thereof, and a red flag attached to said safetying device to indicate that the device is in position thereby allowing the ejection seat to be tilted forward for maintenance and repair work to be accomplished on avionics systems behind and under the seat without danger of accidentally arming the arm/dearm lever.

4,290,569

COWLING PORT CLOSURE AND METHOD

Charles A. McIntyre, Rte. 2, Box 554, Alexandria, Ind. 46001

Filed Nov. 1, 1979, Ser. No. 90,336
Int. Cl.³ B64D *29/00*
U.S. Cl. 244—129.4 **5 Claims**



1. Cowling port closure apparatus comprising:

a first closure member having an edge portion adapted to fit a cowling opening, said edge portion being resilient;

a flexible line extending from said closure member and engaged with said closure member for limited translational movement with respect to said closure member in one direction whereby, upon pulling that portion of said line remote from the closure member, the closure member will be moved by the line in the direction of the pull,

said closure member being a uniform homogeneous piece of polyurethane foam material having dimensions relatively large along two axes by comparison with the third axis, the third axis dimension being the thickness thereof,

said closure member having a generally centrally located aperture therein receiving a portion of said line therethrough;

a comparatively rigid washer around the portion of said line adjacent said closure member at one face of said closure member, and having an aperture therethrough larger than the line but smaller than a knot at the end of said line immediately adjacent such face;

the edge of said closure member being tapered in a direction such that the face thereof adjacent the washer is larger than the face thereof remote from the washer;

a second closure member at an opposite end of said line and substantially identical to said first closure member; and

a washer adjacent a central aperture in said second closure member and having a central aperture receiving the opposite end of said line therethrough and smaller than a knot at said opposite end of said line.

3. Apparatus for excluding birds from air intake openings of engine compartments comprising:

an aircraft engine housing portion having a pair of openings therein for air intake;

a central opening in said housing portion between said intake openings for a propeller shaft;

a propeller shaft extending through said central opening and having a propeller thereon;

a closure member in each of said openings;

a flexible line extending from each of said closure members around said propeller and to the other of said closure members; and

means on said line at said closure members to transmit a force from said line to said closure members for removal of said closure members from said openings upon application of tensile force to said line outside the engine housing portion;

said line being draped over the propeller hub in front of the propeller, and

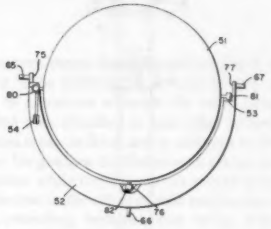
said line extending forward from one of said closure members behind the plane of rotation of the propeller at one side of the propeller shaft axis, and around the front of the propeller above the shaft axis, and back to another of said closure members behind said plane and at the opposite side of said axis, said line being short enough to prevent it from falling down over the front of the hub while both closure members are in said openings.

4,290,570

THREE POINT ATTACHMENT FOR AN EJECTABLE SPACECRAFT

John V. Smolik, Granada Hills; Ronald V. Swanson, San Pedro; Charles P. Rubin, Santa Monica; James C. Blaschke, Huntington Beach, and Roger J. Wagner, Northridge, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 910,722, May 30, 1978. This application Jun. 20, 1979, Ser. No. 50,256
Int. Cl.³ B64G *1/22, 1/14*
U.S. Cl. 244—158 R **1 Claim**



1. Apparatus for fastening a spacecraft in the payload bay of a space shuttle and for launching the spacecraft therefrom comprising:

a generally U-shaped cradle having three trunnions, one at each end and one at the bottom for mounting said cradle to the payload bay of the space shuttle, said trunnions lying in a plane transverse to the longitudinal axis of the shuttle to provide a statically determinant nonredundant connection to the shuttle;

a generally cylindrical spacecraft having three ball trunnions around the periphery thereof for mounting in slots provided in said cradle to form ball joint connections, said ball joint connections and said trunnions lying in a plane perpendicular to the central axis of said spacecraft at approximately the location of the center of mass thereof to eliminate the cantilever effect and thereby reduce loading on the spacecraft, and to permit said cradle to be the reaction platform for ejection of said spacecraft;

three lockable release mechanisms disposed in said cradle and engaging the trunnion balls of said spacecraft; and

an ejection mechanism disposed in said cradle and positioned to engage one of the trunnion balls of said spacecraft for pushing off said spacecraft from said shuttle, said ejection mechanism being arranged to apply its force at substantially zero longitudinal offset from the center of mass of said spacecraft.

4,290,571

HANGER DEVICE, PARTICULARLY FOR PIPELINES IN BUILDINGS

Walter Tremp, Schänis, Switzerland, assignor to Schlossfabrik Schulte & Co., Switzerland

Filed May 17, 1979, Ser. No. 39,828
Claims priority, application Switzerland, Aug. 30, 1978, 9135/78; Apr. 5, 1979, 3175/79
Int. Cl.³ E21F *17/02*
U.S. Cl. 248—59 **16 Claims**

1. A hanger device for pipelines, or the like, comprising:

a housing for being attached to a support; said housing including a wall;

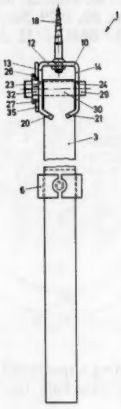
a roll onto which a hanger is rollable; said roll being sup-

ported by said housing wall for enabling annular rotation of said roll with respect to said housing;

first mating means on said roll for being engaged to prevent further rotation of said roll;

a lock; said housing wall including a support thereon for said lock; said support comprising claws pressed out from said housing wall, and said lock being positioned between said claws and said housing wall;

said lock including second mating means thereon for engaging said first mating means; said claws supporting said lock on said housing for preventing rotation of said lock with said roll with respect to said housing;



said lock being movable with respect to said claws of said housing wall for bringing said first and said second mating means into and out of engagement; said lock being supported on said housing to be movable with respect to said roll to a position at which said second mating means are separated from said first mating means, and said lock being supported and placed to normally move under its own weight to cause engagement of said first and said second mating means, for thereby halting further rotation of said roll;

a hanger windable on said roll.

4,290,572

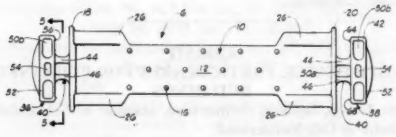
PIPE CLAMP DEVICE

Harold T. Pate, Solon, Ohio, assignor to Indian Head Inc., New York, N.Y.

Continuation-in-part of Ser. No. 970,482, Dec. 18, 1978, Pat. No. 4,225,103. This application Apr. 18, 1980, Ser. No. 141,419

Int. Cl.³ F16H *3/08*

U.S. Cl. 248—74 B **7 Claims**



1. A pipe clamp device comprising:

an elongated flexible strap having a first side, a second side, a pair of opposed side edges, and a pair of opposite ends;

a pair of stop flanges each having one side secured to one of said ends of said strap and extending transversely across the strap;

a pair of tee subassemblies each connected to one of said stop flanges on the opposite side thereof from said strap, and each including:

a crossarm element having a tool-receiving slot therethrough in alignment with the longitudinal axis of said elongated strap for facilitating the twisting of said crossarm element about the longitudinal axis with a leverage tool inserted into said slot;

a flexible, resilient neck portion interconnecting the crossarm element with the respective adjacent one of said stop flanges; and

a locking tab projecting from each of the opposite ends of said crossarm elements toward said adjacent one of said stop flanges.

4,290,573

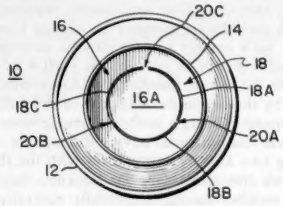
TWO-PIECE PAPER CUP FOR HOLDING ICE CREAM CONES AND THE LIKE

Henry Shapiro, Chicago, Ill., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed May 21, 1979, Ser. No. 40,536

Int. Cl.³ A47G *23/02*

U.S. Cl. 248—152 **5 Claims**



1. An ice cream cone holding and display means comprising:

a container of frustoconical configuration having a frustoconical sidewall open at one end and closed at its narrowmost end by a closure web; and

displaceable flap means defined in said closure web by an interrupted circular cut substantially centrally located in said closure web and having at least two interruptions therein;

one of said interruptions being of a greater extent than the other such that a breaking force applied to said flap means will result in said other of such interruptions being fractured while leaving the first intact;

said flap means being engageable by the apex of an ice cream cone to apply said breaking force to open a port in said closure web and said closure web, upon displacement of said flap, receiving said cone through said port and engageable with the periphery of said cone intermediate its apex and its open end to support said cone upright in said closure web.

4,290,574

KINEMATIC RESTRAINT

John H. Archibald, P.O. Box 283, Golden, Colo. 80401

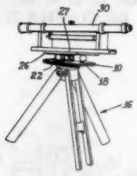
Filed Jun. 2, 1980, Ser. No. 155,493

Int. Cl.³ F16M *11/02*

U.S. Cl. 248—177 **8 Claims**

1. In a restraint apparatus for repeatedly connecting a precision instrument to a support frame in an identical position relative to said support frame, comprising a first plate secured to said support frame and having a generally horizontal planar surface, and a second plate secured to said instrument and having a generally horizontal planar surface, said horizontal planar surfaces of said first plate and said second plate facing one another, and carrying means for providing six contact points, the improvement wherein three of said contact points are provided by contact means comprising three first convex spherical members secured to said facing planar surface of said

first plate in triangular array, and a second convex spherical member secured to the facing planar surface of said second plate, said second convex spherical member being seated upon



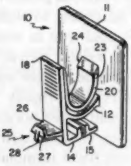
and simultaneously contacting each of said three first convex spherical members at a point and being spaced from said facing planar surface of said first plate.

4,290,575

INTEGRAL CLIP AND HANGER

Everett W. Swartwout, 11 St. Andrews Way, South Yarmouth, Mass. 02664

Filed Jul. 25, 1979, Ser. No. 60,483
Int. Cl.³ A47F *5/00*
U.S. Cl. 248—316 D **9 Claims**



1. A clip comprising:
a pair of opposing jaws;
first and second support means, each having a first end attached to one of said jaws, and a second end distal to said jaw;
means for coupling together said first and second support means in a pivotal connection to permit them to pivot with respect to each other; and
an elongated member of resilient material pivotally attached to the distal end of one of said support means, said elongated member being adapted to be disposed between said support means in a U-shaped curve such that the closed end of the U-shaped curve is directed toward said coupling means and the open end of the U-shaped curve is directed toward the distal ends of the support means, whereby the elongated member abuts the respective first and second support means when disposed therebetween to urge said distal ends apart an urge said jaws together.

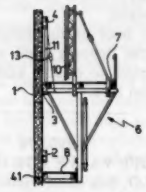
4,290,576

CLIMBING SCAFFOLDING

Artur Schwörer, Senden-Wullenstetten, Fed. Rep. of Germany, assignor to Peri-Werk Artur Schworer KG, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,406
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1978, 2814930
Int. Cl.³ E04B *11/22*
U.S. Cl. 249—20 **16 Claims**

1. In a climbing scaffolding device, said scaffolding device being attachable to a wall of a structure:
a scaffolding platform,
framework means for supporting said scaffolding platform,
connecting means for attaching said framework means to said wall,
the improvement comprising:
said connecting means including at least two projections extending from and supported by said wall, said projections being spaced apart vertically,
said framework means comprising an engaging member that may be attached to either of said projections,



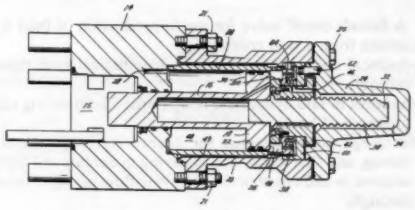
said framework means being constructed and arranged to enable it to be detached from one of said projections, moved to a position adjacent the other of said projections, and then attached to said other projection, and
guide means separate from and in addition to the engaging member for guiding the framework means between said projections while the framework means is being moved from the one to the other of said projections, said guide means extending between and being removably attached to said projections.

4,290,577

BLOWOUT PREVENTER RAM LOCK

Richard A. Olson, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Filed Sep. 24, 1979, Ser. No. 78,093
Int. Cl.³ E21B *33/06*; F15B *15/26*
U.S. Cl. 251—1 A **28 Claims**



1. In a blowout preventer having at least one blowout preventer ram movable therein to adjustable closed positions for sealing contact with a well pipe or the like in a bore of the blowout preventer, a ram lock comprising:
(a) ram carrier means comprising a ram piston having a piston rod with a threaded surface formed thereon for moving the ram to the adjustable closed positions in the blowout preventer;
(b) cylinder means for receiving opening and closing fluid pressures to operate against said ram piston to move the ram to and from open and closed positions, respectively;
(c) lock means for locking said ram carrier means at the closed positions, comprising:
(1) a lock nut having a threaded surface formed thereon and engaged by said threaded surface on said ram piston rod for rotational movement with respect thereto during movement of the ram;
(2) a ram carrier clutch plate mounted with said lock nut for rotational movement therewith, said ram carrier clutch plate having ratchet teeth formed thereon;

(3) a body clutch plate having ratchet teeth formed thereon; and

(4) means for mounting said body clutch plate with the blowout preventer against relative rotational movement with respect thereto; and

(d) means for urging said ratchet teeth of said body clutch plate and said ram carrier clutch plate into engagement to lock said ram carrier means; and

(e) means for unlocking comprising cylinder liner means mounted in said cylinder and enclosing said piston of said ram carrier means;

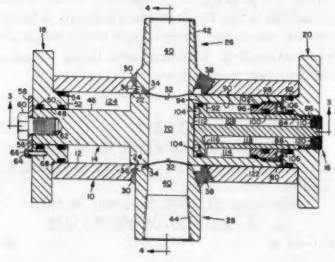
(f) said cylinder liner means including surface means responding to the opening fluid pressure to engage said body clutch plate to disable said means for urging and unlock said ram lock.

4,290,578

FAILSAFE CUTOFF VALVE FOR OIL AND GAS WELLS

Sherald B. Earp, P.O. Box 4586, Victoria, Tex. 77901; Louis L. Lutich, and Jesse W. Harris, both of 107 E. Turbo, San Antonio, Tex. 78216

Filed Sep. 1, 1978, Ser. No. 938,818
Int. Cl.³ F16K *31/143*
U.S. Cl. 251—63 **3 Claims**



1. A failsafe cutoff valve for use in production of fluid hydrocarbons from a well comprising:

cylindrical body portion having a longitudinal bore therethrough;

crossbores in said cylindrical body portion intersecting said longitudinal bore;

first flange means adapted for connecting to production tubing, said first flange means having undercuts and being secured in said crossbores and having flow passages therethrough;

piston means located in said longitudinal bore, said piston means having a transverse bore therethrough with a first position of said piston means aligning said transverse bore with said crossbores;

actuator means extending into said longitudinal bore for moving said piston means to a second position wherein a body portion of said piston means blocks flow through said crossbores;

means for retaining said piston means in said first position until desired movement by said actuator means;

second flange means for sealing ends of said cylindrical body portion; and

means for sealing around said flow passages between said cylindrical body portion and said piston means,

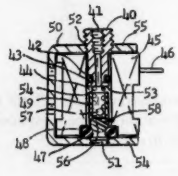
said actuation means including inlet and outlet flow passages extending through a stationary member into an internal bore in said body portion of said piston means, and stationary member slideably sealing with said internal bore, said actuation means sealably connecting through said second flange means to one end of said piston means and being adapted for remote operation to move said piston means to said second position.

4,290,579

O-RING SOLENOID VALVES

Richard Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Dec. 22, 1978, Ser. No. 972,287
Int. Cl.³ F16K *31/06*
U.S. Cl. 251—139 **5 Claims**



1. A solenoid valve comprising:

an encapsulated bobbin coil with a central opening passing therethrough between a first top and a second bottom ends thereof provided with a small counterbore inside said bottom end of said opening to house a seal therein, said opening lined with a smooth protective coating preferably from plastics and adaptable to slidably receive a permanently secured solenoid iron in said first top end of said opening and also an axially movable plunger under said iron, adjacent said second bottom end of said opening, said plunger in valve service normally forced to rest against said seal rendering said valve normally closed,

said coil also including encapsulated and permanently secured protruding electrical terminals for an easy connection to electric circuit to actuate said valve, said plunger of elongated configuration provided with one end flat while the other end is contoured so as to provide better valve sealing when in contact with said seal of said opening bottom end, a means of sealing said iron inside said opening, a yoke of C-clamp configuration that embraces said ends of said coil for coupling said first top and said second bottom ends thereof to permanently secure said coil therebetween is provided with opposing alignment holes in the ends thereof capable of receiving said coil centrally therewith so that said seal inside said counterbore is in line with a bottom hole of said yoke and said solenoid iron in said first top end of said opening is in line with a top hole of said yoke,

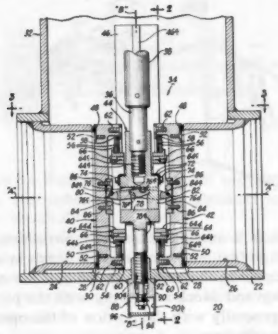
a fluid supply and exhaust means in said valve, and said iron providing a central fluid supply opening passing therethrough from a first yoke protruding top end to a second plunger facing bottom end thereof while said seal and said bottom hole of said yoke serving as a fluid exhaust opening when said solenoid coil is electrically energized to render said iron magnetic and capable of pulling said plunger against it from a first valve normally closed position to a second valve open to exhaust position for fluid communication between said fluid supply opening of said iron and said bottom exhaust via clearances and fluid passages between said plunger and said opening of said encapsulated coil for as long as said solenoid coil is electrically energized, de-energization of said coil electrically eliminates magnetic force said iron entailed and allows automatic return of said plunger to said first normally closed position by a fluid drag force flow is constantly exerting over it, in combination with said yoke holding said encapsulated coil, said iron and said plunger with seal comprising a most simple 2-way solenoid valve adaptable for use with low and moderate fluid pressures in service.

4,290,580

GATE VALVE

Harold J. Balhouse, Corona, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Filed Oct. 9, 1979, Ser. No. 82,967
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—169 **12 Claims**



1. A gate valve comprising:

a valve body including a flow passage having a pair of spaced apart annular valve seats defining a valve chamber therebetween;

a valve gate assembly including a base mounted for transverse movement relative to said passage, a pair of valve discs and a pair of annular spring washers for supporting said discs from said base, said annular spring washers being supported on said base concentrically with said valve discs and normally biasing said discs toward each other so that said assembly can be moved into and out of said chamber without engaging said valve seats;

actuator means for moving said assembly in a given direction from a valve open position in which said assembly is laterally disposed with respect to said valve chamber to a valve seat confronting position in which said discs are aligned with but spaced from said valve seats;

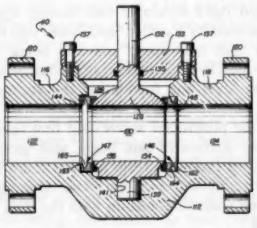
and toggle means interconnecting said actuator means and said discs and operative when said assembly is in said valve seat confronting position for moving said valve discs into engagement with said valve seats against the force of said concentric annular spring washers.

4,290,581

SEAT ASSEMBLY FOR BALL VALVES

George A. Moran, and John B. Williams, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 21, 1979, Ser. No. 77,695
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—172 **4 Claims**



1. A valve comprising:

a valve body presenting a valve chamber and upstream and downstream flow passages on opposite sides of said valve chamber;

a valve member mounted in said valve chamber for opening and closing movement to open and close the valve to flow from the upstream to the downstream flow passage;

upstream and downstream seat pockets formed about the respective upstream and downstream flow passages adjacent the valve chamber, each seat pocket presenting a shoulder spaced from and facing generally toward the valve member;

an annular upstream valve seat mounted in said upstream seat pocket, said upstream seat including a body portion confronting the valve member for sealing therewith and a leg portion extending away from said body portion into sealing contact with said shoulder of the upstream seat pocket, said body and leg portions being flexible relative to one another, said annular upstream seat having a single annular groove about its inner peripheral surface separating said body and leg portions and having a cylindrical outer peripheral surface, said annular groove being exposed to said upstream flow passage for receiving pressure therefrom to spread the body and leg portions apart against the valve member and upstream shoulder when the upstream pressure exceeds the valve chamber pressure; and

an annular downstream valve seat mounted in said downstream seat pocket, said downstream seat including a body portion confronting the valve member for sealing therewith and a leg portion extending away from the body portion into sealing contact with said shoulder of the downstream seat pocket, said body and leg portions of the downstream seat being flexible relative to one another, said annular downstream seat having a single annular groove about its outer peripheral surface separating said body and leg portions and having a cylindrical inner peripheral surface, said annular groove being exposed to said valve chamber for receiving pressure therefrom to spread apart the body and leg portions of said downstream seat against the valve member and downstream shoulder when the valve chamber pressure exceeds the downstream pressure.

4,290,582

WALL PULLER TOOL

Gene R. Eckelkamp, 316 Diener Rd., Washington, Mo. 63090

Filed Apr. 11, 1979, Ser. No. 29,673
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—15 **1 Claim**

1. A wall puller tool for pulling a skeleton construction wall having a plate member an incremental distance along a floor comprising an elongated steel handle member having a pointed end adapted to be struck at the top end into said floor at a pivot point and a laterally extending claw member pivotably connected at a first end to a lower portion of said handle and having a second end provided with a downward perpendicularly extending pointed portion to be struck into said plate, said handle being forcefully moveable away from said plate about

its pivoted end at the pivot point on the floor to cause said plate member to be pulled toward said pivot point, said claw member extending laterally from said pivotable connection about two to twelve inches and the top end of the handle member and the top of the second end of the claw member being provided with an impact surface adapted to be struck by a hammer, the shaft member and the claw member having a channel shaped cross-section to provide rigidity, said claw member cross-section including an integral member having opposed side walls and a top wall, said top wall providing an impact surface adapted to be struck by a hammer, and each of said side walls having a downwardly extending pointed portion at said second end and forming a bifurcated portion at said first end pivotably connected to said handle member.

4,290,583

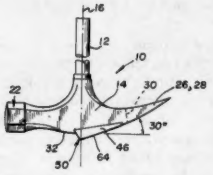
CLAW HAMMER WITH IMPROVED FULCRUM

Michael Lombardi, 556 Princeton Ave., Bricktown, N.J. 08723

Filed Aug. 1, 1980, Ser. No. 174,717

Int. Cl.³ B25C *11/00*

U.S. Cl. 254—26 R **5 Claims**



1. A claw hammer comprising, in combination:

(a) an elongated handle having a longitudinal axis and adapted to receive a hammer head on one end thereof; and

(b) a hammer head having an opening provided therein adapted to receive and cooperate with said handle retaining said handle therein, said hammer being provided with a clawed portion extending forward of said handle longitudinal axis at an angle of between 0° and 30° from the contact surface thereof and an anvil portion extending rearward of said handle longitudinal axis, the contact surface of said hammer head between said clawed portion and said anvil portion being provided with an outwardly wedge-shaped extending portion providing a fulcrum point proximate the longitudinal axis of said handle when said clawed portion is utilized for extracting nails from a surface, the rise of said wedge-shaped extending portion being generally tangent with the surface of said clawed portion for providing a generally flat surface enabling said claw hammer to stand head down on a flat surface.

4,290,584

POLE MOUNTED WINCH

George H. Eckels, Overland Park, Kans.; Donald H. Groft, Forty Fort, Pa., and Wayne R. Stallard, Mission, Kans., assignors to Stelco Inc., Kansas City, Kans.

Filed Aug. 16, 1976, Ser. No. 714,854

Int. Cl.³ B66F *9/00*

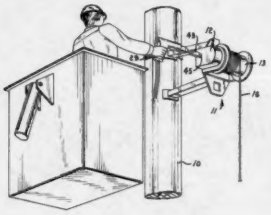
U.S. Cl. 254—380 **9 Claims**

1. The combination of a portable winch equipped with a cable and a mounting bracket for supporting the winch from a pole,

said mounting bracket comprising a bracket support portion adapted to be removably secured to the pole and a winch coupling portion to be spaced from the pole, said coupling portion including a projection having a substantially horizontal axis and terminating in an upwardly projecting lip,

said winch having a base plate provided with an opening therethrough near one end for fitting over said lip and projection, the upper portion of the opening bearing on said projection thereby to suspend the winch from the projection with the lip preventing removal of the winch by axial movement along the projection,

said coupling portion of said bracket and base plate of said winch having cooperating abutting vertically oriented surfaces located remote from said opening which, when



the winch is suspended on said projection, operate to prevent pivotal movement of said winch in any direction with respect to the pole except pivotal movement of said base plate and winch outwardly with the pivot axis coinciding generally with the portion of the opening bearing on the projection.

4,290,585

VEHICLE-STOPPING DEVICE FOR SAFETY BARRIERS

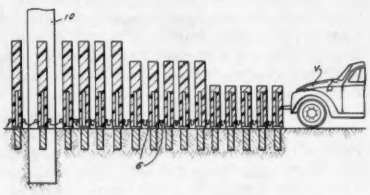
Ernest Glaesener, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Apr. 12, 1979, Ser. No. 29,478

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816487

Int. Cl.³ E61F *15/00*

U.S. Cl. 256—13.1 **7 Claims**



1. A safety barrier adapted to lie in the path of a vehicle directed toward a hazard and formed by an elongated array of spaced apart upright bodies extending toward said hazard, each of said bodies being provided with means enabling the shearing of an upper portion of a body from a lower portion thereof substantially at ground level, each of said bodies comprising:

a first tube received in the ground and defining said lower portion of said body;

an elongated rigid shearable link having upper and lower ends separated by a collar, said lower end having a larger diameter than said upper end and being removably received in said first tube with said collar lying substantially at ground level and facilitating the rupture of said link thereat;

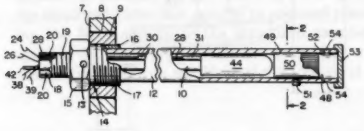
a second tube positioned above said first tube and defining said upper portion of said body, said second tube being filled with a synthetic resin mass of foam formed with a space for removably receiving said upper end of said link in a spaced apart relationship with the wall of said second tube; and

a network of chains of fixed length interconnecting said upper portions of said bodies, said chains being attached to said upper portions adjacent the lower ends thereof.

4,290,586
FURNACE AND METHOD WITH SENSOR

William T. Kane, and William P. Whitney, II, both of Big Flats, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,479
Int. Cl.[3] C21B 7/24
U.S. Cl. 266—80 5 Claims



1. A furnace for heat treatment of metal workpieces in non-oxidizing gas atmosphere containing platinum group metal contaminants, which furnace comprises

an enclosure defining a chamber adapted to contain the workpieces and the atmosphere, the enclosure including at least one wall portion having an oxygen sensor device extending therethrough to monitor the oxygen potential of the atmosphere,

the sensor device comprising a casing with one portion thereof mounted in an opening in the wall portion and a second portion of the casing protruding into the chamber,

the casing having an inlet in the second portion for the atmosphere to continuously enter and flow within the casing from the chamber,

an oxygen sensor mounted within the casing with an electroded portion of the sensor intermediate of the inlet and the one portion of the casing,

the electroded portion comprising a solid oxygen-ion-conducting electrolyte and a film electrode of platinum group metal attached on a surface of the electrolyte arranged to contact the atmosphere flowing within the casing, and

a platinum group metal contaminant getter consisting essentially of the same platinum group metal as in the electrode and arranged in the casing between the inlet and the electroded portion so that the atmosphere passes into contact therewith to effect gettering of the platinum group metal contaminants from the atmosphere.

4,290,587
ORE TREATING APPARATUS

Larry A. Coccia, Elizabeth, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 4, 1979, Ser. No. 81,711
Int. Cl.[3] F27B 1/20
U.S. Cl. 266—191 20 Claims

1. In an apparatus for the gaseous reduction of metal oxide ore including a vessel having an outer wall defining

an upper cylindrical chamber portion

an intermediate chamber portion; and

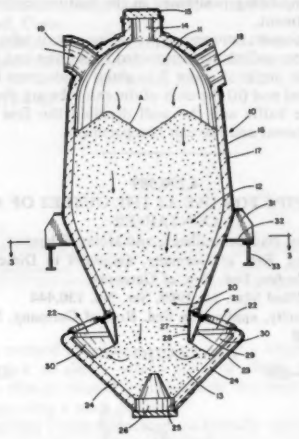
a lower chamber portion

said upper chamber portion including a charging opening, a reduction gas inlet means and a hot gas inlet means,

said intermediate chamber portion being formed by a first frusto-conical portion of said cylindrical outer wall and having at its lower end a relatively narrower throat portion,

said lower chamber portion including a second frusto-conical wall portion at its upper end being of a greater diameter in cross-section than said upper chamber portion, and an upper wall being of frusto-conical shape, converging upwardly, inwardly and being connected to the upper portion of said second frusto-conical cylindrical wall portion and being connected to said narrower throat portion thereby enhancing cooling of said metal oxide ore by reducing gas independent of water cooling,

a plurality of gas outlets provided in said connecting upper wall to direct gas from said reactor outwardly of said vessel, and

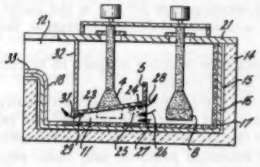


said second frusto-conical cylindrical wall portion having at its lower end a relatively narrow discharge portion.

4,290,588
APPARATUS FOR REFINING MOLTEN ALUMINUM

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,444
Int. Cl.[3] C22B 9/00
U.S. Cl. 266—225 5 Claims



1. In an apparatus for refining molten metal comprising, in combination:

(a) a vessel having four compartments: an inlet compartment, first and second refining compartments separated by a baffle, and an exit compartment separated from the first refining compartment by a common wall, the last three compartments sharing a common bottom surface, wherein (i) the inlet compartment provides a passageway for the molten metal running from the outside of the vessel to the top section of the first refining compartment; (ii) except as provided in (iii), the baffle is constructed in such a manner that it only permits the passage of molten metal over the top of the baffle, (iii) the bottom section of the second compartment is connected to the exit compartment by an exit tube having an opening on each end, a top wall, two side walls and a bottom wall, said exit tube (1) passing through the baffle and the first refining compartment, (2) having its bottom wall residing on the common bottom surface; and (3) having its inlet end opening into the second refining compartment and its outlet end opening into the exit compartment; and (iv) the exit compartment provides a passageway to the outside of the vessel;

(b) one rotating gas distributing device disposed at about the center of each refining compartment, said device comprising a shaft having drive means at its upper end and a rotor

fixedly attached to its lower end, the upper end being positioned in the top section of the compartment and the lower end being positioned in the bottom section of the compartment,

the improvement comprising providing an exit tube wherein (i) the top wall slants downward from inlet end to outlet end at an angle of about 5 to about 15 degrees from the horizontal and (ii) the ends of the exit tube are about flush with the baffle and the wall dividing the first refining compartment and the exit compartment.

4,290,589

TEEMING PIPE FOR USE AT THE OUTLET OF A MELT CONTAINER

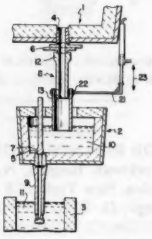
Ernst Lührsen, Bad Schwalbach, and Heinz Schermer, Eltville, both of Fed. Rep. of Germany, assignors to Didier-Werke AG., Wiesbaden, Fed. Rep. of Germany

Filed Mar. 14, 1980, Ser. No. 130,444

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2919880

Int. Cl.³ C21C *5/42*

U.S. Cl. 266—236 **32 Claims**



1. A refractory teeming pipe for use at the outlet of a melt container used in a teeming or casting operation, said teeming pipe comprising:

a refractory inner pipe member adapted to be connected to the outlet of a melt container;

a refractory outer pipe member telescopically slidably mounted about said inner pipe member for axial movement relative thereto between an upper retracted position and a lower extended position, said outer pipe member surrounding said inner pipe member with a narrow annular gap therebetween; and

an upper refractory seal supported by said outer pipe member adjacent the end thereof closest to the melt container, said upper refractory seal closing one end of said annular gap.

4,290,590

APPARATUS FOR SPARGING MOLTEN METAL BY GAS INJECTION

Luc Montgrain, Chicoutimi, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

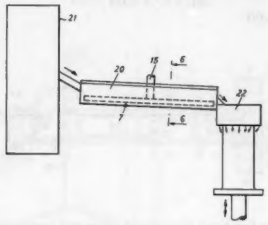
Filed Mar. 2, 1979, Ser. No. 17,165

Claims priority, application United Kingdom, Mar. 6, 1978, 8825/78

Int. Cl.³ C22B *21/06*

U.S. Cl. 266—225 **14 Claims**

1. A gas diffuser plate for supplying sparging gas to molten metal comprising a plate-like base resistant to molten metal, said base having a series of spaced protrusions on the upper surface thereof, gas supply orifice means extending upwardly from the lower surface of said plate-like base to outlets in the top surfaces of said protrusions, each of said protrusions having a minimum transverse dimension of 2–12.5 mm. at the outer ends thereof and being spaced from adjacent protrusions by a distance of at least 0.8 times said minimum transverse dimension, each protrusion having at least two opposed side surfaces steeply inclined to the plate-like base and meeting the top surface of the protrusion at an included angle of no more than 105°, constituting abrupt discontinuities between said top surface and said side surfaces in such manner that gas bubbles



growing at the outlets of said gas orifice means in contact with molten metal are restricted from lateral spread to prevent coalescence with bubbles growing at adjacent gas orifice means.

4,290,591

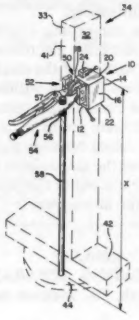
HAND TOOL FOR HOLDING ELECTRICAL OUTLET BOXES DURING INSTALLATION TO A STUD OR OTHER STRUCTURAL MEMBER

Sylvester J. Smith, Rte. E, Box 140A, Newport, Oreg. 97365

Filed Sep. 15, 1980, Ser. No. 187,436

Int. Cl.³ B25B *3/00*

U.S. Cl. 269—6 **9 Claims**



1. A hand tool for holding an electrical outlet box for installation to a stud or other structural member comprising:

box holding means for holding the electrical outlet box; and

box positioning means connected to said box holding means for spacing the front of the electrical outlet box a predetermined distance from the front of the structural member; and

in which said box holding means comprises first and second jaws each having an outlet box gripping surface, and handle means for supporting said jaws in lateral spaced relationship such that the box gripping surfaces of the jaws define a throat therebetween and a mouth through which a side panel of the electrical outlet box is insertable in one direction into the throat, said handle means comprising means for opening and closing said jaws to alternately release and grip a side panel of an electrical outlet box positioned within the throat; and

said box positioning means including stop member means supported by at least one of said jaws and positioned at least partially within the throat for limiting the depth of insertion of the side panel of the electrical outlet box into the throat and for aligning the edge of the side panel of the

electrical outlet box along a first line and thereby the positioning of the front of the electrical outlet box in a first plane containing the first line; and

a first spacing member detachably coupled to the first of said jaws and a second spacing member detachably coupled to the second of said jaws; said spacing members being positioned outside of said throat for engaging the structural member to position the first plane containing the front of the electrical outlet box parallel to a second plane containing the front surface of the structural member and for spacing the front of the electrical outlet box a predetermined distance from the front of the structural member.

4,290,592

APPARATUS FOR PAPER INTERLEAVING AND SEVERING

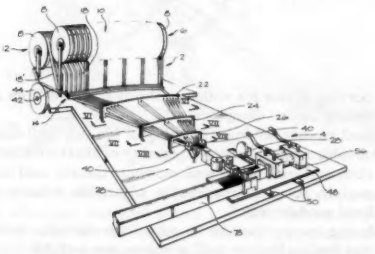
Arnold Kastner, 10220 Armand Lavergne, Montreal, Quebec, Canada

Filed Jan. 2, 1980, Ser. No. 109,094

Claims priority, application Canada, Dec. 6, 1979, 341322

Int. Cl.³ B41L *1/30*

U.S. Cl. 270—40 **8 Claims**



1. Apparatus for folding and interleaving continously moving strips of paper and cutting the interleaved strips into packets of interleaved paper sheets comprising

a plurality of rotatably mounted supply rolls of paper strip for continuously supplying strips of paper,

a series of formers and interleavers positioned sequentially outwardly from the supply rolls to fold and interleave the strips of paper,

drive means for continuously drawing strips of paper from the supply rolls and through the formers and interleavers to to form a strand of interleaved paper strips,

a knife for cutting the strand of interleaved paper strips into interleaved packets of paper sheets of predetermined length,

the knife being mounted on a movable knife plate carried by a platform,

means to reciprocably move the platform in a direction parallel to the direction of travel of the strand of interleaved paper strips a distance equal to the determined length of the packets,

means carried by the platform to reciprocably move the knife plate in a direction normal to the reciprocal movement of the platform, the knife plate advancing and the knife severing a packet from the strand during movement of the platform in the same direction and at the same speed as the moving strand, and

a pusher plate carried by and movable with the knife plate to displace a severed pocket laterally with respect to the direction of travel of the strand.

4,290,593

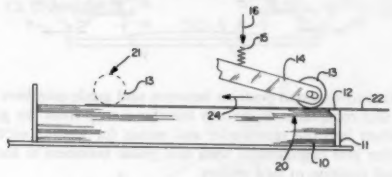
METHOD FOR SHEET FEEDING

Robert Irvine, Riverside, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 836,364, Sep. 26, 1977, abandoned. This application Jun. 27, 1979, Ser. No. 52,521

Int. Cl.³ B65H *3/02, 3/56*

U.S. Cl. 271—42 **2 Claims**



1. In a method of feeding a sheet along a longitudinal path from a stack of sheets, which stack of sheets may include relatively thin or relatively thick sheets, the steps comprising:

(a) supporting a stack of sheets;

(b) applying corner separators to laterally opposed corners of the top sheet of the stack of sheets;

(c) locating a feed roller above the stack in biased contact with said top sheet of the stack of sheets;

(d) moving the feed roller forward for a first stroke from a rest position toward the corner separators with the roller being in frictional contact with said top sheet;

(e) moving the feed roller away from the corner separators in rolling contact with said top sheet to a location further removed from the corner separators than the rest position; and

(f) moving the feed roller on a second stroke toward the corner separators in frictional contact with said sheet, said second stroke being longer than said first stroke and terminating at the rest position, the shorter length of the first stroke inducing stiffness and diminishing the buckling and jamming effects of the corner separators on relatively thin sheets so that said feed roller causes a relatively thin top sheet to separate from the corner separators on the first stroke and be partially advanced from the stack, which thin top is subsequently further advanced by the feed roller on the second stroke, and the longer length of the second feed stroke diminishing the resistance of relatively thick sheets to removal from the corner separators so that a relatively thick top sheet which is not removed from the corner separators by said feed roller on the first stroke will be removed therefrom and advanced from the stack on the second stroke.

4,290,594

APPARATUS FOR STACKING SECTIONS OF DEVELOPED PHOTOGRAPHIC FILMS OR THE LIKE

Heinz Lüdemann, and Franz Ziegler, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,970

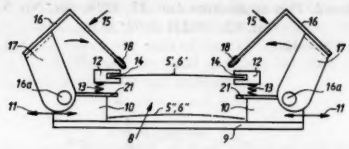
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847774

Int. Cl.³ B65H *29/44*

U.S. Cl. 271—180 **18 Claims**

1. Apparatus for stacking flexible strips, such as sections of photographic films, comprising a receptacle having an open side; a transfer mechanism including a pair of guide members flanking the open side of said receptacle, at least one of said guide members being movable relative to said receptacle so as to enable a flexible strip whose marginal portions are engaged by said guide members to advance between said guide members and into said receptacle, elastically yieldable means for biasing said one guide member to a predetermined position in

which said one guide member is ready to be engaged by an oncoming strip, and means for moving said one guide member relative to said receptacle against the opposition of said biasing means, including at least one pusher movable from a retracted



position to a second position between said guide members and into said receptacle to thereby transfer a strip from the guide members into the receptacle; and means for feeding sections seriatim into engagement with said guide members in the retracted position of said pusher.

4,290,595

ROTATABLE ADVANCE OR FORWARD GRIPPER DRUM

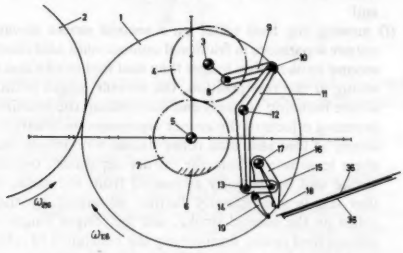
Norbert Thünker, Grosssachsen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 753,486, Dec. 22, 1976, abandoned. This application Oct. 26, 1978, Ser. No. 955,099

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557866

Int. Cl.³ B65H *5/12, 5/14*

U.S. Cl. 271—277 **4 Claims**



1. Continuously rotatable advance gripper drum assembly for sheet-fed rotary printing machines having an advance gripper drum and a gripper bridge movable relative to the drum comprising a camless transmission system including crank-driven linkage transmission means disposed on and rotatable with the drum and operatively connected to the gripper bridge for moving the gripper bridge, said linkage transmission means being mounted by a crank pivot point in the rotatable advance gripper drum, and means for driving said linkage transmission means, said driving means comprising a planetary gearing having a first gear rolling around on a stationary second gear disposed coaxially with the rotatable advance gripper drum, said first gear forming a link in said camless transmission system and being eccentrically connected articulatingly to said linkage transmission means and serving as a driving crank of said linkage transmission means.

3. Continuously rotatable advance gripper drum assembly for sheet-fed rotary printing machines having an advance gripper drum and a gripper bridge movable relative to the drum comprising crank-driven linkage transmission means disposed on and rotatable with the drum and operatively connected to the gripper bridge for moving the gripper bridge, and including a stationary machine frame, and wherein said linkage transmission means comprise a crank mounted in the machine frame, a rocking lever connected at one end thereof to the advance gripper drum, said crank being articulatingly connected to said rocking lever, and a connecting rod connecting the other end of said rocking lever to said gripper bridge, the gripper bridge being driven by said rocking lever.

4,290,596

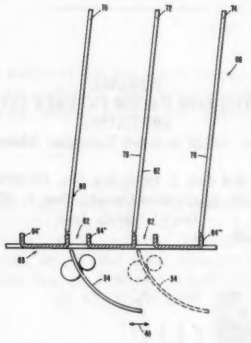
CARRIAGE BIN SYNCHRONIZATION FOR DUAL MODE COLLATOR

Gerald W. Baumann, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,464

Int. Cl.³ B65H *39/115*

U.S. Cl. 271—292 **7 Claims**



1. Sorting device for collating sheets received from a sheet distributing device comprising:

a fixed module having a plurality of bin side wall members;

a movable module having a plurality of alternate sheet entry slots, and bin bottom wall members therein, said movable module being independently adjustable relative to the fixed module; and

indexing means operable to adjust the movable module so that the bin bottom wall members are movable into alternative alignments with the bin side wall members to form a plurality of bottom entry bins.

4,290,597

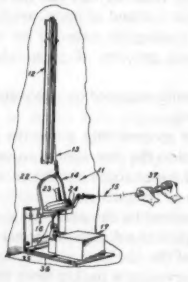
PHYSICAL EXERCISE APPARATUS

John J. Schleffendorf, 2312 Crescent Ave., Waukegan, Ill. 60085

Filed Mar. 10, 1980, Ser. No. 129,115

Int. Cl.³ A63B *21/08*

U.S. Cl. 272—117 **13 Claims**



1. Physical exercise apparatus, comprising:

(a) a support bracket adapted to be fixedly secured in place;

(b) a flexible support line secured at one end to said support bracket and normally extending downwardly from the

point of securement, and a free end at the opposite end of said support line;

(c) weight means secured to said free end of said support line, and supported thereby for upward swinging movement; and

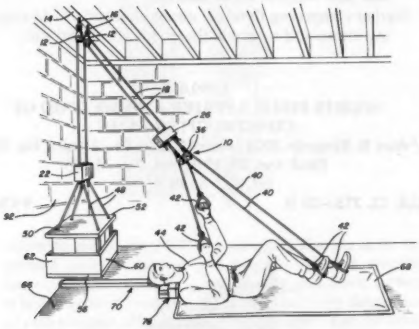
(d) at least one flexible tug line secured at one end to said weight means at a point spaced from said free end of said support line for extending laterally therefrom, and having means at its other end by which a lateral tugging force may be applied thereto, whereby said weight means as it swings upwardly provides progressively greater resistance to said lateral tugging force.

4,290,598

TENSION EXERCISER

Matt W. Flannery, 310 Berry Ave., Westwood, Ashland, Ky. 41101

Filed Mar. 4, 1980, Ser. No. 127,256
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **9 Claims**



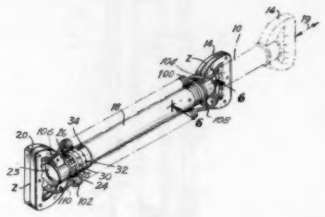
1. In combination with a horizontal first structure and a second structure elevated above said first structure, pulley means in anchored relation to said second structure, abutment means on said first structure spaced normal from an upstanding plane containing said pulley means and against which a person disposed on said first structure may abut at least one portion of his body to prevent sliding of said person relative to said first structure toward said plane, first elongated flexible tension member means having its midportion passed over said pulley means, a first end portion depending downwardly from said pulley means and a second end portion extending downwardly from said pulley means toward said first structure at an incline away from said plane, gravity weight means of predetermined selected value supported from a lower portion of said first end portion, anchor means supported from a lower portion of said second end portion, a pulley assembly supported from said anchor means, second elongated flexible tension member means having its longitudinal midportion guidingly engaged over said pulley assembly and including opposite end body limb engageable portions for engagement by arm and/or leg limbs with forces exerted by the limbs engaged therewith in opposition to the predetermined selected gravity weight value of said weight means supported from said lower portion of said first end portion of said first tension member means, said weight means including an anchor member to which said first end portion is anchored, a pair of superposed upper and lower generally horizontal panel members provided with four openings therethrough spaced about central areas of said panel members and with the openings in said panel members at least generally registered, four elongated upstanding flexible tension member sections having their lower ends slidingly received through corresponding openings in said panel members and anchored through the openings in the lower panel member, the upper ends of said tension member sections being upwardly convergent and anchored relative to said anchor member, and variable weight structure supported on said lower panel member and below the upper panel member.

4,290,599

EXERCISER

Isaac Berger, c/o Ike Berger Enterprises, 263 W. 38th St., New York, N.Y. 10018, assignor to Issac Berger, New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,214
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—130 **14 Claims**



1. An exercising device with a pneumatic resistance element, said device comprising an inner tube, an outer tube in telescoping relationship with the inner tube, handles on the outer ends of the two tubes, the inner end of said inner tube terminating short of the outer end of said outer tube when the tubes are fully telescoped, means closing the outer end of the outer tube, means closing the inner end of the inner tube, said last-named means including flexible resilient means slidably and sealingly engaging the inner surface of the outer tube and substantially preventing the leakage of air between the periphery of said flexible resilient means and the inner surface of the outer tube, first and second check valves within and supported by said outer tube, said check valves carried by the sides of the outer tube end, being disposed between the outer end of the outer tube and said flexible resilient means, said first check valve permitting ingress of air into said outer tube but preventing egress of air from said outer tube, said second check valve preventing ingress of air into said outer tube but permitting egress of air from said outer tube, a sleeve rotatable on said outer tube, said sleeve having a plurality of openings different ones of which are selectively and alternatively coupleable with said check valves to variably control flow of air into or out of said outer tube.

4,290,600

PUSH-PULL PHYSICAL EXERCISING DEVICE

Gert F. Kölbel, Hanover, Fed. Rep. of Germany, assignor to Compret N.V., Amsterdam, Netherlands

Filed Feb. 21, 1978, Ser. No. 879,581
Claims priority, application United Kingdom, Sep. 9, 1977, 37820/77
Int. Cl.³ A63B *21/02*
U.S. Cl. 272—137 **24 Claims**

1. A physical exerciser comprising: an elongate telescopic system having ends, said system being contractibile longitudinally by the application of pressure;

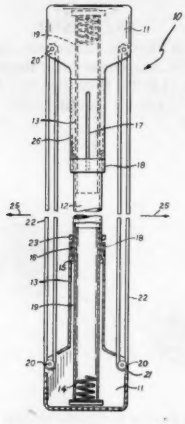
resilient biassing means arranged to resist said longitudinal contraction of said system;

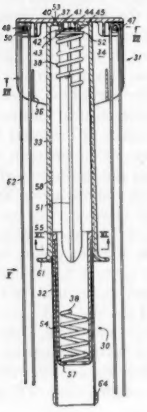
at least two flexible tension means, each said tension means extending longitudinally in at least two runs;

a guide member associated with each of said tension means, said guide member being substantially adjacent one end of said system, each tension means passing around said associated guide member, said at least two runs extending unbroken from said guide member to a location substantially adjacent the other end of said system,

said system contracting on pulling of said tension means

away from said system, the amount of said contraction for a given pulling force being selectable by selecting the





number of said runs of said tension means which are pulled.

4,290,601

WOBBLE PLATE EXERCISE DEVICE AND TOY

Robert A. Mittelstadt, 15117 Orchard Dr., Burnsville, Minn. 55337

Continuation of Ser. No. 799,544, May 23, 1977, abandoned, which is a continuation of Ser. No. 600,637, Jul. 31, 1975, abandoned. This application Apr. 2, 1979, Ser. No. 25,890

Int. Cl.[3] **A63B** *23/04;* **A63G** *1/12*

U.S. Cl. 272—146 **18 Claims**

1. An apparatus for imparting rotating and wobble motion to an operator, comprising:

a base member,

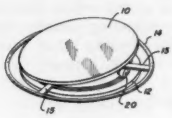
a board member disposed above said base member and adapted to support an operator standing thereon,

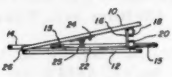
shaft means interconnecting said members for rotation and wobble motion of said board member relative to said base member about a predetermined axis of rotation,

roller means disposed between and engaging both of said members at a radial position relative to said axis and angularly separating said members,

and supporting means for said roller means,

said supporting means being mounted for rotation about said axis whereby the impartation of downward force on said board member by the foot of an operator standing thereon





causes said board member to rotate and wobble relative to said base member about said axis,

further comprising flywheel means attached to said supporting means and rotatable therewith about said axis.

4,290,602

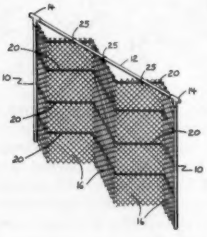
SPORTS FIELD BARRIER AND METHOD OF CONSTRUCTING SAME

Robert B. Kennedy, 8925 Huntcliff Lake Ct., Atlanta, Ga. 30338

Filed Apr. 27, 1979, Ser. No. 34,126

Int. Cl.[3] **A63B** *61/00*

U.S. Cl. 273—29 R **9 Claims**



1. A sports field barrier for arresting the flight of a ball moving in one direction over a field of play and for rebounding the ball in another direction generally and usually reciprocal to the one direction and with the barrier being erected uprightly along a zigzag course adjacent the field of play and comprising a pair of mutually spaced stanchions mounted uprightly along said course supporting a beam, and wire mesh fencing including a plurality of intermeshed wire coils extending generally horizontally along said zigzag course mounted to said pair of stanchions and suspended from said beam.

4,290,603

BALL EJECTING GOLF CUP

Howard H. Barnes, Box 14, Missouri City, Tex. 77459

Filed Jun. 9, 1980, Ser. No. 157,217

Int. Cl.[3] **A63B** *57/00*

U.S. Cl. 273—34 A **4 Claims**

1. A golf cup comprising:

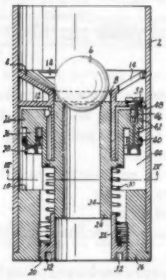
a. an open-end body member adapted to be sunk vertically into the turf of a golf green, with its open top substantially flush with the ground surface,

b. upper and lower closures mounted in said body member in vertically spaced apart relation to form a chamber therebetween, said upper closure being spaced below the top of said body member whereby to define, with said body

member, an open-topped cup into which a golf ball may fall, said closures sealing against said body member and each having a central aperture opening therethrough, the diameter of the aperture of at least the upper closure being greater than that of a golf ball.

c. a plunger closely fitted in the central aperture of said closures for limited vertical sliding movement, and substantially sealing said chamber,

d. ejecting means biasing said plunger to the upper limit of its movement, a golf ball dropping into said cup coming to rest on the upper end of said plunger when the latter is at the upper limit of its movement, whereby when said plunger is then manually depressed by downward pressure on said ball and subsequently released, it will be raised rapidly by said ejecting means to throw said ball upwardly from the upper end of said body member,



e. retaining means operable to retain said plunger in its depressed position against the pressure of said ejecting means, and constituting a suction cup and anvil surface which may be moved into engaging relation by depression of said plunger, one carried by said plunger and the other by one of the closures of said body member, said suction cup and said anvil being disposed within said substantially sealed chamber of said body member, whereby to prevent the passage of dirt or other foreign material thereto, all portions of said chamber having free air communication around said plunger, whereby no motion-impeding vacuums or pressures are generated by the motion of said plunger, and

f. releasing means operable to reduce said retaining means after a pre-determined time lapse from its engagement, and constituting means operable to admit air between said suction cup and said anvil surface.

4,290,604

RACQUETBALL RACQUET HAVING A METAL FRAME MESHABLE WITH A THROAT PIECE

Franklin R. Held, San Diego, Calif., assignor to Ektelon, San Diego, Calif.

Filed Aug. 7, 1979, Ser. No. 64,367

Int. Cl.[3] A63B *49/02*

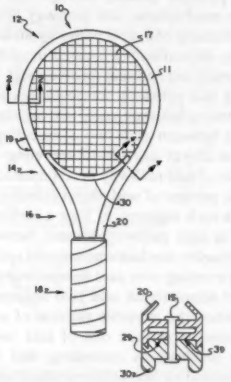
U.S. Cl. 273—73 G **4 Claims**

1. A racquet having a metallic frame with a throat piece, wherein the improvement comprises:

the frame structure having a flat inner surface having a width, an outer surface, two side portions, and two extending flanges protruding outwardly from said inner surface at said side portions; each of said extending flanges having a height and having a flat surface connected to said flat inner surface and further having an outwardly beveled surface connected to said side portion; said inner surface width greater than said extending flange height;

the combination of said flat surfaces of said extending flanges and said flat inner surface forming an orthogonal recess, having greater width than depth;

the throat piece structure having an inner surface, a flat outer surface, having a width, two side portions, and two notched recesses intruding inwardly from said throat piece outer surface at said throat piece side portions, each of said notches recesses having a depth and having a flat surface connected to said flat outer surface and further having an outwardly beveled surface connected to said side portion; said outer surface width greater than said notched recess depth; the combination of said outer surface and said notched recesses at said side portions forming an orthogonal protrusion having a greater width than height;



said orthogonal protrusion of said throat piece in meshable, mated contact with said orthogonal recess of said frame, said meshable, mated contact occurring at said flat inner frame surfaces contiguous with said flat outer throat surfaces, and at said flat recess surfaces contiguous with said flat flange surfaces;

said beveled recess surfaces contiguous with said beveled flange surfaces; whereby the combination of said throat piece structure and said frame structure resists differential stress and strain caused by bending and torsional stress and strain.

4,290,605

GAME HAVING PATHWAY TRAVERSING A PLURALITY OF INDEPENDENT OBJECT TRANSFER MECHANISMS

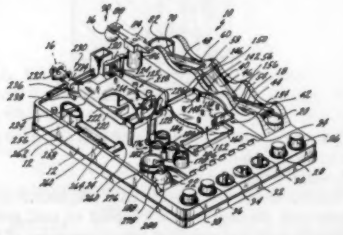
Takao Matsumoto, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 106,454

Claims priority, application Japan, Dec. 25, 1978, 53-180518[U]

Int. Cl.[3] A63F *7/00*; A63H *33/00*

U.S. Cl. 273—110 **16 Claims**



1. A game of skill which comprises:

a support housing;

a plurality of independent object transfer mechanisms of at least two nonidentical types located on said housing and arranged in a sequence with respect to one another, at least a portion of each of said object transfer mechanisms movable with respect to said housing;

a plurality of control means located on said housing, each of said control means operatively connected to at least one of said object transfer mechanisms to move with respect to said housing that portion of said object transfer mechanism which is movable;

an object pathway passing through said sequence of object transfer mechanisms, said pathway having a starting end and a finishing end, said pathway including a plurality of pathway discontinuities located in said pathway between said starting end and said finishing end, said discontinuities dividing said pathway into segments so as to interpose a discontinuity between each two adjacent segments and a segment between each two consecutive discontinuities;

a spherical object capable of traveling over each of said segments of said pathway in response to movement of said movable portion of said object transfer mechanism which contains each segment, at least a portion of said discontinuities in said pathway located between two adjacent object transfer mechanisms and said spherical object capable of traversing over said discontinuity between said two adjacent segments on said two adjacent transfer mechanisms when the movable portion of said object transfer mechanism of at least one of said two adjacent object transfer mechanisms containing said two adjacent segments located on two adjacent object transfer mechanisms is realigned with respect to the other of the two adjacent object transfer mechanisms by moving said movable portion of said one of the two object transfer mechanisms;

said spherical object capable of traveling from said starting end of said pathway to said finishing end of said pathway when said spherical object successfully travels over all of said segments of said pathway and traverses all of said plurality of discontinuities in said pathway.

4,290,606

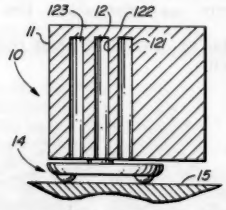
NONPREDICTABLE GAME PROJECTILE

Thomas J. Maxwell, 13252 N. 47th Pl., Phoenix, Ariz. 85032

Filed Nov. 5, 1979, Ser. No. 91,176

Int. Cl.[3] A63F *7/40, 7/24*

U.S. Cl. 273—128 R **6 Claims**



1. Apparatus in which a movable piece is projected across a playing surface comprising

a polyhedral projectile; and

low friction means for moving said polyhedral projectile across said playing surface coupled to said polyhedral projectile such that a vertical axis of symmetry of said low friction moving means is displaced from the mass center of said polyhedral projectile.

4,290,607

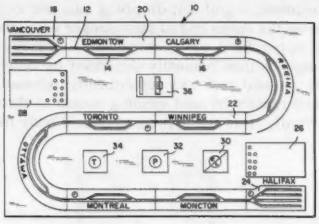
TRAVEL GAME DEVICE

Gerald F. McDonald, 169 Reveillon St., Apt. 10, Sept Iles, Quebec, G4R 3R3, Canada

Continuation-in-part of Ser. No. 692,365, Jun. 3, 1976, abandoned. This application May 17, 1979, Ser. No. 39,872

Int. Cl.[3] A63F *3/00*

U.S. Cl. 273—239 **4 Claims**



1. A game device comprising a game board having simulated map route means with starting and terminal destinations, intermediate destinations between said starting and terminal destinations marked thereon:

(1) a first set of cards, each card in said first set indicating at least one opportunity for:

(a) revenue generation,

(b) railroad car and/or locomotive drops,

(c) card trading,

(2) a second set of cards, each card of said second set indicating at least one opportunity for:

(a) train repairs without cost,

(b) advancing game pieces,

(c) revenue generation,

(3) a third set of cards, each card of said third set indicating at least one disadvantage of:

(a) road and equipment impediments to prevent the advance of a game piece,

(b) the assessment of fees,

(4) a fourth set of cards, each card of said fourth set indicating commodity hauling rights comprising a license for hauling commodities listed thereon, and the revenues to be gained from said commodity hauling rights;

(5) chance means having railroad signal light colors and indicia corresponding to said card sets for the selection of a card from said set or said railroad signal light color comprising dice means having green, yellow and red colored sides and one side each bearing indicia referring to said first set, second set and third set of cards;

(6) game piece means, the movement of said game piece being controlled by the selection of said railroad signals or one card from said sets of cards by said chance means, said chance means also operative to select one of said cards to control the play of said game.

4,290,608

LOBSTER TRAP GAME

Robert O. Brown, Nautilus Rd., Gloucester, Mass. 01930

Filed Oct. 5, 1979, Ser. No. 82,071

Int. Cl.[3] A63F *3/00*

U.S. Cl. 273—256 **2 Claims**

1. A game for at least two players comprising the steps of:

providing a board having a portion thereof depicting water with a grid of lines interposed thereover defining a plurality of spaces with a portion of said board further depicting around at least three edges shoreline with at least one dockage area;

providing at least one player piece in the shape of a lobster boat including means for carrying lobster trap indicia for movement on the spaces of water between said grid lines;

providing lobster trap indicia for placement on preselected of said spaces of water;

providing indication means for determining the weight of lobsters to be caught in said lobster trap indicia

providing rock indicia means on selected of said spaces of water;

providing high and low tide time indication means and means for determining the fate of a player piece positioned on a space having rock indicia means during low tide;

providing lobster trap position indicator means on preselected spaces;

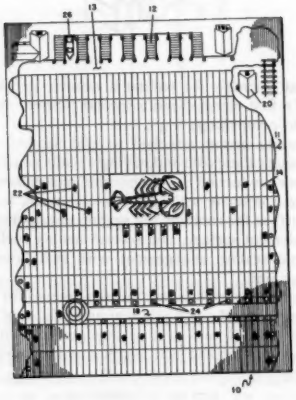
providing a timer as said indication means for indicating periods of high tide and low tide, chance number selection means, and money indicia;

receiving by a player of a predetermined amount of money indicia;

determining by a player by said chance number selection means the price of lobster;

activating by a player said timing means to indicate the period of high tide;

determining by a player by said chance number selection means the number of spaces his lobster boat shall move;



moving by a player said lobster boat to said space starting on the first move from said dock;

depositing by a player a lobster trap indicia if desired upon a space having lobster trap receipt means if such space is adjacent to the space said lobster boat is on;

returning said lobster boat by a player by said chance selected number of moves to said dock after setting all of said traps;

recovering by a player all of said traps by moving in a desired direction said chance-selected number of moves; at the end of the period of high tide, each player whose lobster boat is on a space having rock indicia means thereon being assigned a fate through actuation of the fate determining means;

determining the weight of lobster in each trap after returning it to said dock by selecting one of said weight indication means; and

determining the price of the lobster in each trap by comparing the weight of the lobster therein and the determined price of lobster.

4,290,609

STEAM SEAL

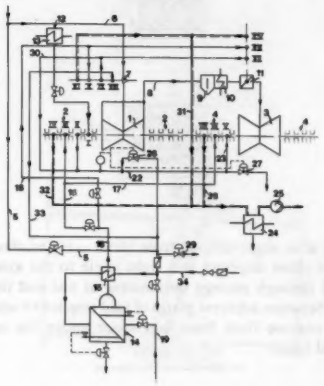
Willy Dumont, Nussbaumen, Switzerland, assignor to BBC, Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed Aug. 27, 1979, Ser. No. 70,107

Claims priority, application Switzerland, Aug. 31, 1978, 9183/78

Int. Cl.³ F16J *15/40*

U.S. Cl. 277—3 **14 Claims**



1. In a fluid seal apparatus for a member, which fluid seal apparatus includes a plurality of spaced-apart seal rings arranged about said member defining at least a first region, a second region, and a third region in communication with the atmosphere and with a low pressure chamber at a pressure below atmospheric pressure, which regions communicate with one another and which are sequentially arranged with respect to the member to be sealed, a first source of first fluid, and a second source of a second fluid, the improvement comprising:

first means for conducting said first fluid from said first source to said first region at a first pressure, said first pressure being below atmospheric pressure;

second means for conducting said second fluid from said second source to said second region at a second pressure, said second pressure being greater than atmospheric pressure;

third means for conducting a mixture of air and said second fluid from said third region to said low pressure chamber, said second fluid flowing from said second region to said third region and air flowing from the atmosphere to said third region; and

fourth means for withdrawing a mixture of said first and second fluids from said first region, said second fluid flowing from said second region to said first region, whereby pure seal steam may be supplied as said second fluid while impure seal steam may be supplied as said first fluid to prevent the leakage of said impure steam.

4,290,610

LABYRINTH SEAL

Vadim A. Lizogub, Orekhovy bulvar, 11, korpus 1, kv. 101; Alexandr P. Kushnir, Paveletskaya, naberezhnaya, 10 korpus 2, kv. 40; Alexandr M. Figatner, proezd Rusanova, 31, korpus 2, kv. 47, and Stepan E. Bondar, ulitsa Vvedenskogo, 22, korpus 2, kv. 297, all of Moscow, U.S.S.R.

Filed Feb. 28, 1980, Ser. No. 125,454

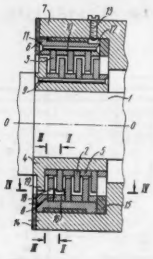
Claims priority, application U.S.S.R., Jan. 4, 1978, 2565435

Int. Cl.³ F16J *15/44*

U.S. Cl. 277—13 **3 Claims**

1. A labyrinth seal for a shaft, comprising: a stationary sleeve coaxial with said shaft; a first set of ring plates rigidly fixed to said shaft; a second set of ring plates fixed to said stationary

sleeve; said ring plates of the first set and said ring plates of the second set being arranged in an alternating fashion in parallel with one another and coaxially with said shaft; said sleeve having at least one through passage; said through passage being arranged in a plane intersecting the axis of said shaft and



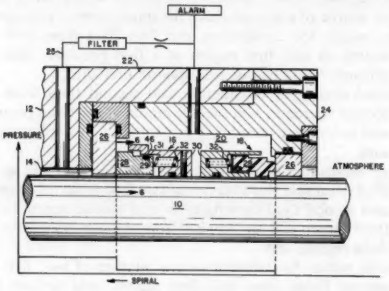
extending at an angle ranging from about −60° to about +60° to a radial plane disposed at a right angle to the axis of said shaft; said through passage terminating at one and thereof in the space between adjacent plates of said respective sets of ring plates to remove fluid from said space under the action of centrifugal force.

4,290,611

HIGH PRESSURE UPSTREAM PUMPING SEAL COMBINATION

Josef Sedy, Glenview, Ill., assignor to Crane Packing Co., Chicago, Ill.

Filed Mar. 31, 1980, Ser. No. 135,925
Int. Cl.³ F16J *15/16*
U.S. Cl. 277—27 **12 Claims**



1. A mechanical end face seal combination for sealing the annular space between a housing and a rotating shaft, passing there through, said seal comprising:

(a) a first end face seal having a primary ring sealingly mounted for rotation with said shaft and a mating ring mounted in sealing engagement with said housing, said primary and secondary rings having mating, radial sealing faces;

(b) a second end face seal positioned inboard of said first seal to define a buffer zone between said first and second seals, said second seal including a primary ring constrained for rotation with said shaft and a mating ring carried by said housing, said rings having radial faces in mating sealing engagement; one of said rings having a flat circumferential dam area on a portion of the diameter of its face and spiral grooves extending for the remaining circumferential portion of its face, said grooves being positioned to pump fluid from the buffer zone of said seal across the dam face and into the inboard high pressure side of said second seal; and

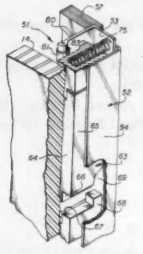
(c) said buffer zone containing a buffer fluid to be pumped inboard of said inboard seal against the pressure of the fluid to be sealed.

4,290,612

SURFACE CONFORMING THERMAL/PRESSURE SEAL

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Martin L. Stevens, Setauket, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,593
Int. Cl.³ B32B *9/04*
U.S. Cl. 277—81 R **18 Claims**



1. A seal assembly for sealing a variable gap between the surface of a first element and a second element movable relative thereto comprising:

seal housing means attached to said second element for movement therewith and having a sealing surface thereon;

sealing means carried by said housing means having first and second conjugate sealing surfaces thereon, said first sealing surface for rubbing and sealing engagement with said first element surface, said second sealing surface for sliding and sealing engagement with said housing sealing surface; and

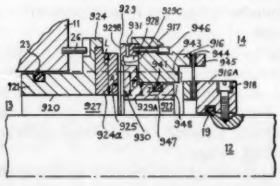
biasing means carried by said housing means for biasing said first and second conjugate sealing surfaces of said sealing means toward said sealing engagement with said first element surface and said housing sealing surface, respectively.

4,290,613

POSITIVE CLEARANCE RADIAL FACE SEALS

Peter A. J. Scott, Brighouse, England, assignor to Associated Engineering Limited, Warwickshire, England

Filed Sep. 20, 1979, Ser. No. 77,433
Claims priority, application United Kingdom, Sep. 22, 1978, 17715/78
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—96.1 **16 Claims**



1. A positive clearance radial face seal characterised in that at least one of its two opposed sealing faces comprises a pressure-deflectable elastic or elastically loaded element which initially provides a substantialy planar sealing face in the radial

direction and which deflects, in steady state operating conditions, to provide a clearance between the sealing faces which converges in the radial direction to a minimum clearance at an annular zone between the downstream ends of the opposed sealing faces, the deflection changing with variations in the operating conditions in a manner to increase the convergence in the radial direction towards said downstream zone of the seal under the action of increased load on the seal and thereby tending to restore said steady state minimum clearance.

4,290,614

SEALING CONSTRUCTION FOR VACUUM CONNECTION

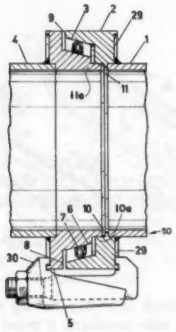
Eberhard Moll, Balzers, Liechtenstein, assignor to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dünne Schichten, Liechtenstein

Filed Mar. 26, 1979, Ser. No. 23,782

Claims priority, application Switzerland, Mar. 30, 1978, 3390/78

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—205 **10 Claims**



1. A sealing construction for a vacuum connection comprising:

a first engageable member having a first conical sealing surface, an outer centering portion and a first stop surface;

a second engageable member having a second conical sealing surface juxtaposable adjacent said first conical sealing surface, an inner centering portion for receiving outer centering portion to center said first and second engageable members and a second stop surface abuttable against said first stop surface for fixing an axial relative displacement between said first and second engageable members and providing a space between said first and second conical sealing surfaces; and

an annular metallic ring having a C-shaped cross-section disposed between said first and second conical sealing surfaces with legs of said C-shaped cross-section rollable against said first and second conical sealing surfaces to produce a seal between said first and second engageable members.

4,290,615

BUTTERFLY VALVE

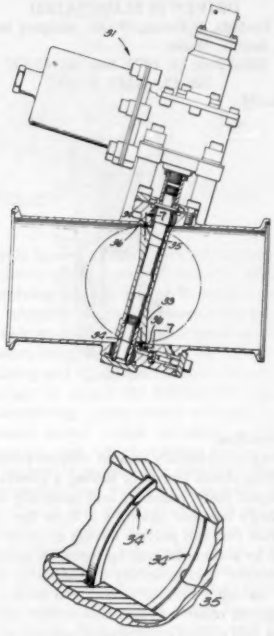
John P. Etcheverry, Sylmar, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 14, 1979, Ser. No. 103,499

Int. Cl.³ F16K *5/06*

U.S. Cl. 277—221 **4 Claims**

1. A valve comprising: a hollow cylindrical conduit having an axis; pivot means extending through said conduit and through the axis thereof; a butterfly valve including a disc fixed to said pivot means in a manner to rotate therewith, said butterfly valve disc having a peripheral surface of revolution about said axis when said butterfly valve is closed, said conduit having a cylindrical groove therein symmetrical with said surface of revolution when said butterfly valve is closed; and a ring of rectangular cross section in said groove to seal against said surface of revolution, said groove having annular side walls, said ring being split at one point around its periphery and having mating ends at said point, one of said ends having a notch, the other of said ends having a projection to fit in said notch, said notch being V-shaped and being defined between two flat surfaces lying in planes normal to said side walls and inclined relative to each other at a predetermined angle, said two flat inclined planes intersecting in a line normal to said side walls, said projection having two surfaces inclined at said predetermined angle to form a wedge shaped body having an edge in a line normal to said side walls to fit contiguous to the bottom of said notch.



4,290,616

GASKETS

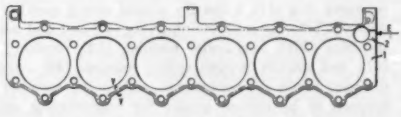
Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, County Durham, England

Filed Mar. 25, 1980, Ser. No. 133,843

Claims priority, application United Kingdom, Nov. 23, 1979, 40625/79

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—235 B **3 Claims**



1. A gasket comprising a pair of outer metal plates having outwardly directed corrugations formed therein and a central composite metal plate disposed between the two outer plates,

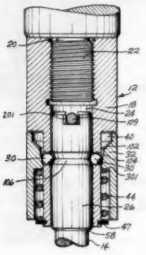
the said central composite plate comprising a central soft metal layer having hard metal layers on each surface.

4,290,617

MOTOR QUICK-CHANGE CHUCK SYSTEM FOR TOOL HAVING CYLINDRICALLY SHAPED ADAPTER PORTION WHEREIN RELATIVE LONGITUDINAL MOVEMENT BETWEEN CHUCK AND TOOL BEING DRIVEN IS ELIMINATED

Edward M. Yoshida, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 11, 1979, Ser. No. 47,537
Int. Cl.³ B23B *31/10*
U.S. Cl. 279—75 **1 Claim**



1. In combination:

a tool having cylindrically shaped adapter portion **(26)**;

a tool-holding chuck assembly having a generally cylindrically shaped body member, said generally cylindrically shaped body member having a hollow first end portion, said hollow first end portion having an inner wall surface threaded to accept the mating threaded spindle of a stationary motor, said generally cylindrically shaped body member having a hollow second end portion concentrically disposed relative to said hollow first end portion for receiving said cylindrically shaped adapter portion in slip fit relationship therewith, said cylindrically shaped adapter portion having a transversely disposed slot **(110)** at one end thereof, said generally cylindrically shaped body member including a drive pin **(109)** disposed between said hollow first end portion and said hollow second end portion for engaging said transversely disposed slot **(110)** in said received cylindrically shaped adapter portion **(26)** and rotationally driving said tool, said drive pin **(109)** when also engaging said transversely disposed slop **(110)** further functioning to provide locking of said tool and preventing longitudinal movement;

said cylindrically shaped tool adapter portion including a groove circumferentially disposed in the outer surface of said cylindrically shaped adapter portion;

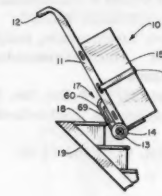
said tool-holding chuck assembly including three shperically shaped ball elements, a collar member **(32)** having an internal shoulder **(301)**, a recess **(40)** and first **(102)** and second **(104)** ramp surface portions formed in the inner wall surface thereof, said second ramp surface portion **(104)** inclined with a slope of about five degrees with respect to the central axis of said collar member **(32)**, a retaining ring **(47)**, a spirally wound spring member **(44)** disposed between said retaining ring **(47)** and said internal shoulder **(301)**, said collar member **(32)**, retaining ring **(47)**, and spirally wound spring member **(44)** coaxially disposed about the central axis, said collar member **(32)** adapted to be moved axially for compressing spirally wound spring member **(44)** between said retaining ring **(47)** and said internal shoulder **(301)** thereby positioning said recess **(40)** and first ramp surface portion **102** for receiving said three cylindrically shaped ball elements to provide release of said cylindrically shaped adapter portion of said tool from said tool holding chuck assembly.

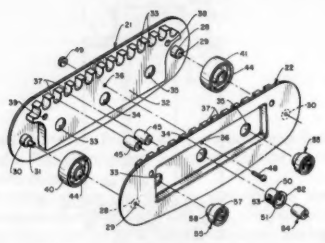
4,290,618

HAND TRUCK STAIR TREAD ENGAGING DEVICE

John C. Morton, Yuba City, Calif., assignor to Clamor Company, Marysville, Calif.

Filed Apr. 16, 1979, Ser. No. 30,459
Int. Cl.³ B62B *5/02*
U.S. Cl. 280—5.22 **12 Claims**





1. In a hand truck assembly having a wheel and handled frame, including side members, a tread engaging device secured to one of the side members of the frame, said tread engaging device including an endless V-belt for engaging the tread of a stairs and roller means thereon, the improvement which comprises:

said roller means including a plurality of barrell-shaped rollers having flat end walls and a bulging sidewall, each of said rollers being mounted in an individual cavity in said device and rotatable about their own axes, said rollers being generally linearly aligned and non-linearly movable with respect to said device, with said V-belt making full contact with more than one of said rollers only when said V-belt abuts against a generally flatsurface and said rollers, and making contact with only one of said rollers when a portion of said V-belt engages the edge of a stair and impacts against said only one of said rollers, said tread engaging device further including flange means at each of the two ends thereof to maintain said V-belt on said device.

4,290,619

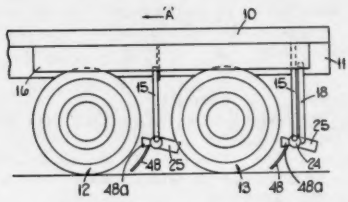
SPRAY INHIBITING MEANS FOR USE ON A ROAD VEHICLE

Maurice Goodall, Silverhill, Barton-under-Needwood, Burton-upon-Trent, Staffordshire, England

Filed Mar. 28, 1979, Ser. No. 24,515
Int. Cl.³ B62D *25/16*
U.S. Cl. 280—154.5 R **4 Claims**

1. Spray-inhibiting means for use on a road vehicle, said means comprising a screen adapted to be mounted adjacent to a vehicle tire so as to be capable of intercepting air and water spray which, in wet conditions, will be thrown off said tire, collecting means for collecting such air and water intercepted by said screen, said collecting means including means for in-

creasing pressure on said collected air and water spray, and discharging means for discharging the collected water from the vehicle, said discharging means being directed rearwardly of the vehicle so that vehicle velocity is subtracted from water



discharge velocity so water is discharged at such a velocity relative to the vehicle velocity that water deposited on the road surface by said discharging means will have zero or only a low velocity in a horizontal direction relative to said road surface.

4,290,620

STRUCTURE TO COUPLE TWO BICYCLES

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 437,482, Jan. 28, 1974, abandoned. This application Aug. 8, 1975, Ser. No. 597,311

Int. Cl.[2] B62K *13/06*

U.S. Cl. 280—209 **71 Claims**

1. A torsionally resilient interconnecting structure for coupling two compatibly configured bicycles into side-by-side parallel relationship for simultaneous operation as a single four-wheel vehicle comprising: (1) a plurality of specifically configured cross members each bent to form a longer mid-portion and two shorter end-portions; said longer mid-portions positioned substantially horizontally and transversely between the coupled bicycles with said shorter end-portions being aligned with correspondingly positioned frame tubes of said bicycles and being attached to said frame tubes at two spaced apart points along each aligned section; and (2) a modified trapezium steering linkage operatively interconnecting conventional steerable front wheels of said bicycles enabling the vehicle to be efficiently steered from either one of said bicycles.

4,290,621

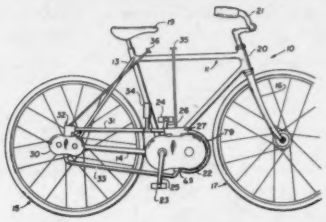
BICYCLES

Joseph A. Davey, 250 Beach 134th St., Belle Harbor, N.Y. 11694

Continuation-in-part of Ser. No. 961,718, Nov. 17, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,853

Int. Cl.[3] B62M *19/00*

U.S. Cl. 280—216 **7 Claims**



1. In a bicycle having a frame with bifurcated members for supporting a drive wheel, a pair of rotatably supported pedal means for applying manual power to propel the bicycle, a drive wheel rotatably supported on said frame, said wheel including an axle member and a wheel rotating element, and a drive mechanism connected to said pedal means and to said wheel for rotating said wheel when manual power is applied to said pedal means to propel the bicycle, an improved drive mechanism comprising: pump means actuated by said pedal means; hydraulic motor means including a drive member adapted to engage said wheel rotating element, said motor means being supported on said axle member outwardly of the bifurcated frame members; means for detachably securing said motor means on said axle member with said drive member in engagement with said wheel rotating element; flexible hydraulic hose means connecting said pump means to said motor means for transmitting hydraulic fluid from said pump means to said motor means and returning the fluid from said motor means to said pump means; valve means for controlling the quantity of hydraulic fluid transmitted to said motor means when said pedal means are rotated at a fixed rate; and manually operated means for actuating said valve means to vary the quantity of hydraulic fluid transmitted to said motor means, the arrangement being such that the motor means drive member can be disengaged from said drive element to permit removal of said motor means from said axle member and said wheel from said frame without interrupting the hydraulic connections between said pump means and said motor means.

4,290,622

HINGE UNIT FOR ARTICULATED VEHICLES

Tibor Horvath, Gyor, Hungary, assignor to Magyar Vagon- es Gepgyar, Győr, Hungary

Filed Jul. 25, 1978, Ser. No. 927,933

Claims priority, application Hungary, Aug. 15, 1977, MA 2903

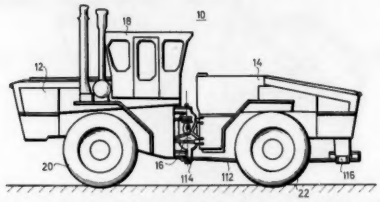
Int. Cl.[3] B62D *53/02*

U.S. Cl. 280—400 **4 Claims**

1. In a hinge unit for connecting a front frame structure and a rear frame structure of an articulated power vehicle permitting mutual angular displacement of said front frame structure and said rear frame structure about a vertical axis and about a horizontal axis, a front member connectable to said rear frame structure, and an intermediate member supported by a pair of bearings in said front member aligned along said vertical axis, and by a pair of bearings in said rear member aligned along said horizontal axis, the improvement in which the bearings of one of said pairs of bearings are on opposite sides of the axis of alignment of the bearings of the other pair of bearings, the front member carrying a traction bar arranged for pivotal

movements around said vertical axis and connected to said rear frame structure.

4. In a hinge unit for connecting a front frame structure and a rear frame structure of an articulated power vehicle permitting mutual angular displacement of said front frame structure and said rear frame structure about a vertical axis and about a horizontal axis, a front member connectable to said rear frame structure, and an intermediate member supported by a pair of bearings in said front member aligned along said vertical axis, and by a pair of bearings in said rear member aligned along said



horizontal axis, the improvement in which the bearings of one of said pairs of bearings are on opposite sides of the axis of alignment of the bearings of the other pair of bearings, each bearing of each pair of bearings having clearance with its associated said member in both axial directions, the clearance of each bearing in one axial direction being of different magnitude from the clearance of the bearing in the other axial direction, the clearances of each said pair of bearings being arranged in mirror image relation to each other thereby to prevent both bearings of the same pair of bearings from being loaded by axial forces simultaneously.

4,290,623

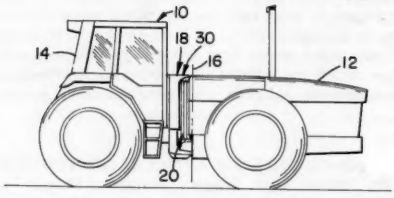
COVER FOR A TRACTOR'S ARTICULATION SPACE

George E. Bowman, Country Club Hills; David S. Faust, Bolingbrook, and David T. Kataoka, Berwyn, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,434

Int. Cl.[3] **B62D** *53/02*

U.S. Cl. 280—400 **5 Claims**



1. In an articulated tractor having front and rear sections pivotally connected on the articulation axis of said tractor, said articulation axis being in close proximity to the articulation space defined as the space between the trailing surface of said front section and the leading surface of said rear section, improvement including, in combination:

an enclosure substantially enclosing said articulation space, said enclosure including at least two flexible bellows defining an opaque area between the forward, rearward, top and bottom edges of each of said bellows, at least four bands, a plurality of elements rigidly securing one of said bands to each of said forward and rearward edges and a plurality of members rigidly secured to said bands;

a support rigidly secured to one of said front and rear sections to pivotally support said enclosure;

a mechanism pivotally connecting said enclosure and said support, said mechanism including a pair of primary pivotal connections between said mechanism and said support, and two corresponding pairs of secondary pivotal connections between said mechanism and said enclosure;

a plurality of retainers rigidly secured to said leading and trailing surfaces, said retainer being resiliently and slidably connected to said members; and

at least two stiffeners pivotally connected to said mechanism, one of said stiffeners flexibly reinforcing each of said bellows.

4,290,624

RELEASE SETTING INDICATING DEVICE FOR A SKI SAFETY BINDING

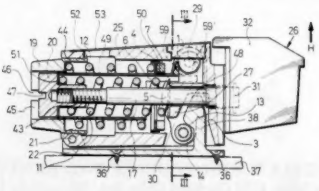
Ralf Storandt, Leonberg, Fed. Rep. of Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Leonberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 2455, Jan. 10, 1979. This application Aug. 10, 1979, Ser. No. 65,543

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835733

Int. Cl.[3] **A63C** *9/08*

U.S. Cl. 280—634 **25 Claims**



1. A release setting indicating device for a ski safety binding having sole clamp means retainable in a skiing position by first and second release mechanisms the release settings of which are respectively determined by first and second coil springs, wherein said first coil spring is disposed within said second coil spring and means are provided for independently adjusting the positions of respective adjustment ends of the first and second coil springs that are spatially remote from said first and second release mechanisms to adjust the release settings thereof, and wherein said indicating device is adapted to indicate the release setting of the first inner coil spring and comprises a tube surrounding said inner coil spring with play therebetween, and means constraining the tube for axial movement together with said adjustment end of the inner coil spring, said tube having an axial projection at its other end which projects beyond the adjacent end of the outer coil spring to a position in which said projection is visible from outside the binding.

4,290,625

FOLDABLE LUGGAGE CARRYING DEVICE

Alain Barriere, 30, rue Buffon, 94210 La Varenne, France

Filed Oct. 24, 1979, Ser. No. 87,781

Claims priority, application France, Feb. 12, 1979, 79 03442; Jul. 18, 1979, 79 18575

Int. Cl.[3] **A45C** *13/38;* **B62B** *1/04*

U.S. Cl. 280—654 **7 Claims**

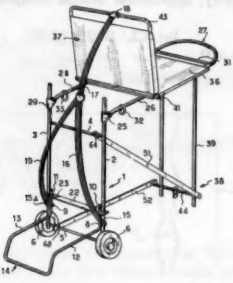
1. A foldable luggage carrier comprising:

(a) a first frame having an upper end, a lower end, two upright sections, an upper horizontal bar generally transverse to said sections, and a lower horizontal bar generally transverse to said sections, wheels attached to said lower bar, and a baggage support;

(b) a second frame pivotably mounted to said upper end of said first frame and movable between an operative position in which said second frame forms an extension of said first frame, a storage position in which said second frame is pivoted against said first frame, and a seat position in

which said second frame is generally horizontal, said second frame including a seat unit; and

(c) a movable prop journalled to said second frame and comprising means for simultaneously supporting said second frame in said generally horizontal seat position and said first frame in a generally vertical position, said prop comprising two parallel bars having lower ends, a first crossbar connecting said parallel bars at said lower ends, a



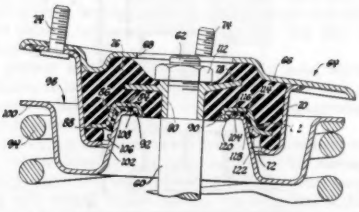
plurality of struts, each strut pivotably attached to said first crossbar at one strut end and having a hook at a second strut end, the length of said struts being selected so that when said second frame is in said seat position and said prop is in a generally vertical position with a free end of said prop resting on ground or other surface, the hook of one of said struts engages said lower horizontal bar of said first frame and the hook of another of said struts engages said upper horizontal bar of said first frame.

4,290,626

DUAL FUNCTION STRUT BEARING

Leo S. Sullivan, Jr., and Richard A. Muzechuk, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1980, Ser. No. 143,718
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—692 **3 Claims**



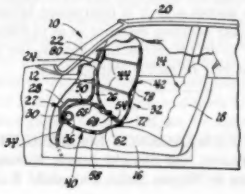
1. In a vehicle having a sprung mass, an unsprung mass, and a strut type suspension system including relatively telescopable members disposed between said sprung and said unsprung masses for relative telescopic movement along a unit axis defined by said members, and a helical spring disposed around said telescopable members, one of said telescopable members being attached to said sprung mass and the other of said telescopable members being rotatable relative to said sprung mass, the improvement comprising, means rigidly attaching one end of said spring to one of said sprung mass and said other of said relatively telescopable members, bearing race means on the other of said sprung mass and said other of said telescopable members defining a first bearing surface for resisting force components directed parallel to said unit axis and a second bearing surface for resisting force components directed at an angle to said unit axis, retainer means disposed between the other end of said spring and said race means and including a third bearing surface parallel to said first bearing surface and a fourth bearing surface parallel to said second bearing surface, a unitary bearing member disposed between said first and said third bearing surfaces and between said second and said fourth bearing surfaces so that said spring supports said sprung mass on said unsprung mass with said bearing members accommodating relative sliding motion between itself and one of said retainer means and said bearing race means thereby to permit rotation of said other of said telescopable members and said spring relative to said sprung mass, said unitary bearing member being fabricated from a material exhibiting increasing coefficient of friction with increasing surface contact velocity so that said unitary bearing member retards rapid relative rotary oscillation between said bearing race means and said retainer means about said unit axis.

4,290,627

L-SHAPED INFLATABLE RESTRAINT CUSHION

Richard J. Cumming, Warren; John DeBano, Roseville; Harold J. Mertz, Jr., Harper Woods; Donald L. Nordeen, Birmingham; Vincent F. Sajewski, Sterling Heights, and John F. Zens, Algonac, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1979, Ser. No. 99,870
Int. Cl.³ B60R *21/08*
U.S. Cl. 280—729 **3 Claims**



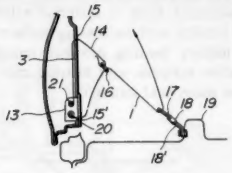
1. In combination with a vehicle body having a seat cushion and a seat back opposite a windshield and an instrument panel, the latter of which is provided with a cavity containing a gas generator, an inflatable restraint cushion for limiting forward movement of a seated occupant, said inflatable restraint cushion adapted to be connected to said gas generator in said cavity and to be deployed rearwardly relative thereto when inflated, said inflatable restraint cushion being formed from a flexible material and including a top wall and a bottom wall joined together so as to define a lower generally horizontally orientated compartment having a front end adapted to be attached to said gas generator and a rear end adapted to engage the knees of said seated occupant when said lower compartment is inflated; a front wall and a rear wall joined together to form an upper compartment having laterally spaced side portions; means connecting said front wall and said rear wall to said top wall so that said upper compartment is vertically orientated relative to said lower compartment to cover said instrument panel and said windshield when inflated by said gas generator, said top wall having at least one opening formed therein for allowing gas emanating from said gas generator to flow from said lower compartment to said upper compartment; and means located between said side portions for interconnecting said front wall to said rear wall so as to control the extent that said rear wall moves relative to said front wall and thereby minimize enveloping engagement between the torso of seated occupant and said inflatable restraint cushion when the latter is inflated.

4,290,628

PASSIVE SEAT BELT EQUIPMENT

Hiroo Okuyama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 7, 1979, Ser. No. 101,240
Claims priority, application Japan, Dec. 20, 1978, 53-160477
Int. Cl.³ B60R 21/02
U.S. Cl. 280—803 2 Claims



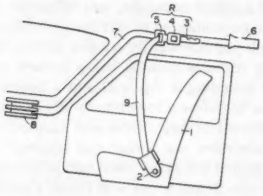
1. A passive seat belt equipment for a vehicle comprising;
a buckle to be connected to a central portion of a floor or to a seat of the vehicle,
a lap belt which is stretched between one end thereof coupled with a retractor to be installed inside of a rear bottom portion of a door of the vehicle and the other end thereof to be fixed on a rear top portion of the door through a ring having a tang which is coupled with said buckle,
an auxiliary belt which is stretched between one end thereof connected with a through ring through which said lap belt is stretched and the other end thereof coupled with a winding member to be installed inside of the door through a slit formed on the door above said retractor, and
a transmission means which is interposed between said retractor and said winding member so as to force said winding member to do reverse action against the winding and rewinding of said retractor respectively.

4,290,629

SEAT BELT EMERGENCY LOCKING DEVICE

Takeo Ueda, Fujisawa, and Shuichi Asano, Kawasaki, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1979, Ser. No. 64,383
Claims priority, application Japan, Aug. 18, 1978, 53-101335
Int. Cl.³ B60R 21/10
U.S. Cl. 280—806 6 Claims



1. In a latching device for a vehicular seat belt for retaining the end portion of the seat belt during a sudden change in the motion of the vehicle, said latching device including a tongue portion held to the end portion of said seat belt, and a latch portion mountable within said vehicle and adapted to receive said tongue portion and retain it in response to a sudden change in the motion of the vehicle, the improvement wherein said tongue portion includes a retaining tooth and an auxiliary tooth spaced from said retaining tooth, said latch portion including inertia-sensitive means engaging said auxiliary tooth upon initially sensing a sudden change in the motion of the vehicle and retaining means thereafter actuated to engage said retaining tooth for securely holding said tongue portion whereby said inertia-sensitive means need not be capable of sustaining the full forces tending to separate said tongue portion from said latch portion.

4,290,630

SECURITY DEVICES

Peter D. Lee, Hertford, England, assignor to Governor & Company of the Bank of England, London, England

Filed Feb. 27, 1978, Ser. No. 881,502
Claims priority, application United Kingdom, Mar. 1, 1977, 8628/77
Int. Cl.³ B42D 15/00
U.S. Cl. 283—8 R 10 Claims

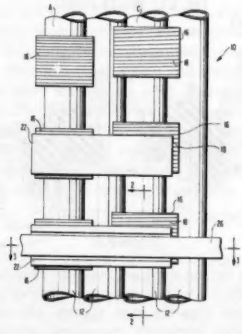
1. A currency document comprising a sheet element bearing thereon legible information and incorporating authenticating means in the form of a visible thin strip, said strip having along at least a portion of one edge of a width dimension of said strip a wave-form variation, said variation defining coded information relating to the document.

4,290,631

SUBMARINE PIPE CONSTRUCTION

J. Hilbert Anderson, York, Pa., assignor to Sea Solar Power, York, Pa.

Filed Apr. 6, 1979, Ser. No. 27,915
Int. Cl.³ F16L 39/00
U.S. Cl. 285—137 A 10 Claims

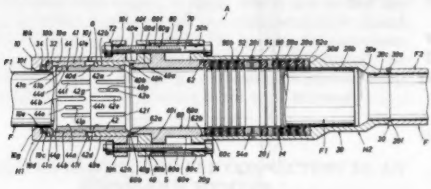


1. A large diameter pipe adapted to be submerged in a body of water in substantially a vertical direction, said pipe being constructed of a plurality of sections or segments of parallel hollow tubes or pipes arranged with their axes parallel to the axis of the pipe with the diameter of said tubes or pipes being less than the diameter of said pipe, an expansion sleeve positioned in the lower end of each tube of one section and in the upper end of each tube of the subjacent section for connecting and joining the ends of adjacent tubes, a shear sleeve segment provided on a portion of the external surface of said expansion sleeve, a shear clamp engaging said shear sleeves and tension means engaging said clamps for retaining them in engagement with said shear sleeves.

4,290,632
APPARATUS FOR CONNECTING TOGETHER FLOWLINE END PORTIONS

Luther L. Manchester, Jr., 810 Woodstock, Bellaire, Tex. 77401, and Bobby J. Reneau, 15527 Morales, Houston, Tex. 77032

Continuation of Ser. No. 1,758, Jan. 8, 1979, abandoned. This application Sep. 4, 1980, Ser. No. 184,041
Int. Cl.[3] F16L *21/06*
U.S. Cl. 285—323 13 Claims



1. A grip-seal apparatus for connecting first and second flowline members for fluid flow therethrough, comprising:

a first housing having a bore therethrough for receiving the first flowline member;

a second housing having a bore therethrough adapted for partly receiving the first flowline member extending through said first housing bore;

gripper means having a bore therethrough mounted in said first housing bore for moving radially inwardly into gripping engagement with the first flowline member upon relative axial movement between said first and second housings;

sealing means mounted in said second housing bore for moving radially inwardly into sealing engagement with the first flowline member;

said gripper means including a gripper member having a flange portion mounted with said second housing;

an activating sleeve mounted partly in said gripper member and partly in said second housing bore for axial movement into engagement with said sealing means;

fastening means including a plurality of threaded shafts extending between said first and second housings, said fastening means cooperating with said flange portion of said gripper member, said activating sleeve, and said first and second housings for fastening said first and second housings together;

said gripper member being mounted for axial movement relative to said first housing for movement of said gripper means radially inwardly into gripping engagement with the first flowline member;

said activating sleeve mounted for axial movement relative to said second housing, said fastening means for moving said activating sleeve into engagement with said sealing means for moving said sealing means radially inwardly into sealing engagement with the first flowline member; and,

second housing connector means with said second housing for connecting said second housing to the second flowline member in order to establish fluid flow between the first and second flowline members.

4,290,633
LOCK FOR HOUSEHOLD REFRIGERATORS

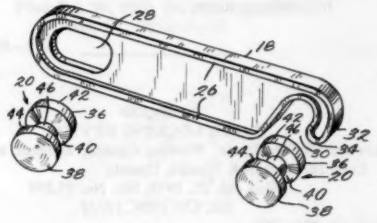
William P. Sullivan, 1400 Farrington Way, Columbia, S.C. 29210

Filed Oct. 9, 1979, Ser. No. 82,926
Int. Cl.[3] E05C *5/02*
U.S. Cl. 292—114 12 Claims

1. A refrigerator having a front door swingable on a vertical axis between open and closed positions and magnetic means for yieldably retaining said door in said closed position;.

a pair of relatively short posts, each having a circumferential groove intermediate its ends, the end of one of said posts being adhesively secured to a flat surface on said refrigerator normal to its front with said one post projecting normally from said surface and the end of the other of said posts being adhesively secured to the edge of said door generally normal to said surface with said other post projecting normally from said edge, said posts being adjacent, generally parallel to each other and removed from said vertical axis; and

an elongated plate-like locking member of a thickness less than the width of said grooves in said posts, said member having in one end portion thereof an elongated slot extending generally lengthwise of said member, the width of said slot being less than the diameter of said posts but

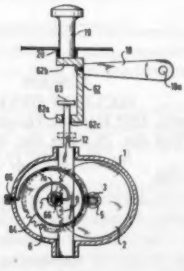


greater than the diameter of the bottom of said post grooves, said member having in its other end portion an elongated notch extending inwardly from one edge of said member to define a locking hook, the width of said notch being greater than the diameter of said bottom of said groove, said member being pivotally and slidably engaged with said one post with the side edges of said slot engaged within the groove therein and said hook being releasably engageable within the groove in said other post, whereby when said hook is so engaged said door is locked shut but when disengaged said door can be opened by a force sufficient to overcome the retaining force of said magnetic means.

4,290,634
ELECTRICALLY AND MANUALLY OPERABLE LOCKING MECHANISM AND DRIVE ARRANGEMENT FOR THE SAME

Egon Gelhard, Cologne, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Munich, Fed. Rep. of Germany

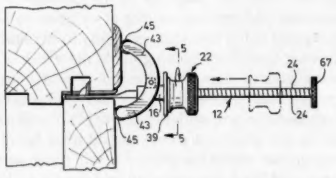
Continuation-in-part of Ser. No. 865,939, Dec. 30, 1977, which is a continuation-in-part of Ser. No. 739,818, Nov. 8, 1976, abandoned. This application May 3, 1978, Ser. No. 902,346
Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721970
Int. Cl.[2] E05C *13/10*
U.S. Cl. 292—201 19 Claims



1. A drive arrangement comprising:

(a) an inertial mass having a center of gravity and mounted for rotation about an axis;
(b) an electric motor drivingly connected to said mass for rotating the same about said axis;
(c) a movable output member;
(d) motion transmitting means operatively interposed between said mass and said member, said motion transmitting means including
(1) delay means for transmitting motion from said mass to said member after acceleration of said mass about said axis, and
(2) disconnecting means for disconnecting said member from said mass after a predetermined motion of said member transmitted to said member by said motion transmitting means.

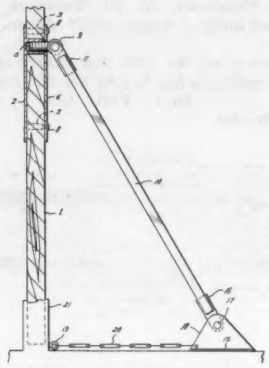
4,290,635
DOOR LOCKING DEVICE
Kenneth B. McKenzie, Weston, Canada, assignor to Port-A-Lock Incorporated, Weston, Canada
Filed Jul. 25, 1979, Ser. No. 59,894
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—290 **7 Claims**



1. A portable door lock comprising:
an elongated flat bar for insertion between a door and a door frame, the flat bar having flat sides, narrow upper and lower edges, and hook means at one end for engaging the frame,
a slide block having an internal opening for receiving said flat bar such that the slide block is slidable along the flat bar,
a brace member pivotally mounted on the slide block and supporting two spaced contact surfaces projecting in the direction of the hook means, whereby one surface can rest against the door and the other against either the frame or the wall adjacent the frame, the contact surfaces being formed by resilient plastic tubes mounted on metal posts,
and releasable means for preventing the slide block from moving along the flat bar in the direction away from the hook means.

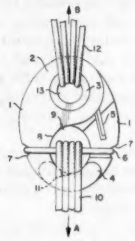
4,290,636
SECURITY DEVICE
Richard J. Steele, 2202 Harwell, Houston, Tex. 77026
Filed Jan. 29, 1980, Ser. No. 116,558
Int. Cl.³ E05C *17/36*
U.S. Cl. 292—338 **1 Claim**

1. In a security device, plates mounted on the door, an inwardly extending pivotally mounted bar mounted at one end on said plates, a base member pivotally mounted on the other end of said bar, means for maintaining said base member at a preselected distance inwardly from said door, said plates comprising an outside plate and an inside plate, the outside plate having inwardly extending, inwardly threaded sockets and the inside plate having ports to receive mounting screws and an



enlarged port to receive an eye-bolt to which the said bar is mounted.

4,290,637
SEPARATION MECHANISM FOR RELEASING AN AERODYNAMIC BRAKING DEVICE FROM A LOAD
Klaus H. Fischer, Troisdorf; Heinz Kroschel, Troisdorf-Sieglar, and Heinrich Kolf, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany
Filed Aug. 6, 1979, Ser. No. 63,746
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1978, 2834435
Int. Cl.³ B64D *17/38*
U.S. Cl. 294—83 A **29 Claims**



1. A separation mechanism for detaching an aerodynamic braking device from a load, the separation mechanism being adapted to be connected to at least one suspension element of the braking device and of the load and being adapted to automatically release at least one of the suspension elements upon a relief of a load thereon, characterized in that the separation mechanism is constructed as a closed system and includes at least two holding members, means are provided for connecting the two holding members to each other so as to enable relative movement therebetween, said holding members are arranged so as to form at least part of an enclosure which is closed along its entire periphery so as to define an opening for accommodating the at least one suspension element to be automatically released, means are provided for locking the holding members in a closed position defining the opening, said locking means are adapted to be released by a stress exerted on the suspension element, and in that, said holding members are constructed so that, even after a release of the locking means, the at least one suspension element to be released is held under a stress of at least one of the holding members and can be released only after

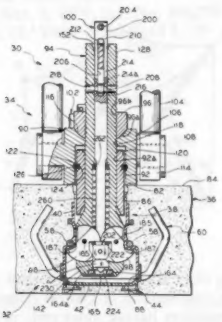
a relief of such stress, and wherein the holding members are held in the closed position by a stress applied by the suspension element after a release of the locking means and the holding members move relative to each other into an open position only upon relief of the stress with the relative movement of the holding members resulting in an interruption in the enclosure of the opening along a portion of the periphery of such enclosure thereby enabling the at least one suspension element to be released, and wherein said connecting means includes a common pivot means for mounting the two holding members so as to be pivotable with respect to each other, and in that the holding members together form the entire enclosure closed along its entire periphery defining the opening for accommodating the at least one suspension element to be released, the common pivot means including an opening for accommodating the suspension element which is not to be released.

4,290,638

APPARATUS FOR RELEASABLE CONNECTION TO AN EMBEDDED MEMBER

Lindley Manning, Reno, Nev., assignor to Superior Concrete Accessories, Inc., San Diego, Calif.

Filed Oct. 17, 1979, Ser. No. 85,913
Int. Cl.³ B66C *1/66*
U.S. Cl. 294—89 **22 Claims**



1. In apparatus for releasable connection to a member embedded in an object adjacent to a cavity which provides access to the member and communicates with an opening in an external surface of the object, said member having a plurality of lug-engagement surfaces disposed in angularly spaced relation about said cavity and each facing in a direction away from said external surface, the improvement comprising:

a housing having an inner end portion and an outer end portion and extending longitudinally therebetween, said housing being adapted for insertion of its inner end portion through said opening and into said cavity,

means defining a longitudinal bore in said housing,

means defining a plurality of lug-mounting sockets in said inner end portion, each of said sockets communicating with said bore laterally inwardly of the socket and having a laterally outer mouth disposed to face an adjacent one of said lug-engagement surfaces when said inner end portion is in said cavity,

a lug mounted in each of said sockets for reciprocal rotational movement therein between a first disposition wherein a portion of the lug protrudes laterally through the mouth of the socket into engagement with the adjacent lug-engagement surface to connect the apparatus to said member, and a second disposition wherein said lug portion is withdrawn from said engagement to release the apparatus from the member,

actuating means longitudinally movably mounted in said bore for reciprocation between first and second positions to engage said lugs and rotate them correspondingly between their first and second dispositions, said actuating means having first reaction surfaces disposed when in said first position between said lugs in engagement therewith and thereby providing resistance acting to prevent the lugs from being rotated out of their first dispositions by load forces exerted on the lug by said member, and

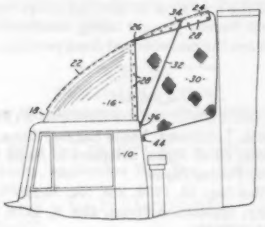
seating means for each lug included in said socket-defining means and providing a second reaction surface facing in a direction toward said external surface of the object and engaging the lug for transferring to said housing load forces exerted on the lug by said member.

4,290,639

WIND DEFLECTOR

Donald R. Herpel, 29466 Candlewood, Southfield, Mich. 48076

Filed Jan. 28, 1980, Ser. No. 116,038
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **7 Claims**



1. A device for reducing wind resistance of a road vehicle having a forward roof section and a second section having a portion positioned rearwardly and above said forward section comprising:

a pivotably mounted rigid fairing joined to the forward section with an outer surface for wind deflection and an interior portion;

said fairing pivotable between a rest position where the outer surface has no substantial wind deflection characteristics and a raised operative position where the outer portion directs air flow between the vehicle sections;

air actuating means for raising said fairing from rest to operative position during movement of the vehicle; and

said air actuating means comprising a member inflatable by a portion of the air flow passing over the forward section generated during forward movement of said vehicle where inflation of the member pivots the fairing to the operative position.

4,290,640

EXTERNAL COVER FOR AN AUTOMOBILE ROOF HAVING A MOVABLE PANEL

Gerald P. Dalton, 2520 Buena Vista, Arlington, Tex. 76010

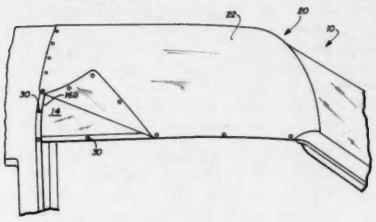
Filed Dec. 26, 1979, Ser. No. 107,360
Int. Cl.³ B60J *1/20*
U.S. Cl. 296—95 R **13 Claims**

1. An external and supplemental cover assembly adapted for full-time use on an automobile, including those times when the automobile is being driven such that wind-related forces are present, comprising:

(a) a flexible cover adapted for selective attachment to an automobile roof so as to lie in intimate contact with said roof, and the cover having a size which is adequate to completely overlay that portion of an automobile roof having one or more movable panels, and the cover being sized to extend slightly beyond the joints between the fixed and the movable portions of the roof so as to cover those joints when the cover is installed;

(b) anchoring means adapted for selectively anchoring the leading edge of the cover to the roof near the top edge of the automobile's windshield, and said anchoring means

being effective to prevent air from being forced between the flexible cover and the automobile roof as the automobile is being driven; and

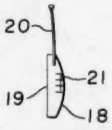


(c) mechanical connecting means adapted for selectively connecting the side and rear edges of the cover to rigid portions of the roof so as to hold the cover firmly next to the roof and thereby prevent falling rain from striking the joints between the movable and fixed portions of the roof.

4,290,641
METALLIC PANEL REINFORCING SYSTEM

Seiroku Miyauchi, Yokohama; Yasuo Sagane, Zama, and Kazuo Irie, Yokohama, all of Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan

Filed Sep. 26, 1979, Ser. No. 79,195
Claims priority, application Japan, Oct. 6, 1978, 53/122738; Dec. 6, 1978, 53/150032
Int. Cl.[3] B60J 5/04
U.S. Cl. 296—146 **5 Claims**



1. A reinforcing system for reinforcing a metallic panel, including a fiber reinforced plastic reinforcing beam extending substantially in parallel to said panel and comprising:

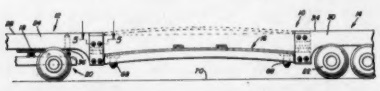
at least two flanges whose height extends in perpendicular to said panel, one edge of each said flange being positioned adjacent said metallic panel; and

a web plate connecting adjoining ones of each of said at least two flanges, each said web plate having a height extending parallel to said panel and being spaced from each said one edge by a distance, said distance being less than one half of said height of said at least two flanges.

4,290,642
CONVERTIBLE FLAT/DROP TRAILER

Donald E. Wise, 128 E St., Apt. D, Springfield, Oreg. 97477

Filed May 13, 1980, Ser. No. 149,308
Int. Cl.[3] B62D 27/02
U.S. Cl. 296—182 **11 Claims**

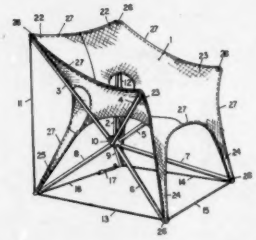


1. A trailer construction including front, rear and center sections, said front section including hitch means for attachment to a towing vehicle and said rear section including ground engageable support wheels, said front and rear sections including longitudinally spaced generally horizontally aligned upper deck portions, said front section including rear vertically spaced upper and lower mounting portions, said rear section including front vertically spaced upper and lower mounting portions, said center section being horizontally elongated and defining an upper deck extending longitudinally therealong, the opposite ends of said center section including rear and front anchor means engageable with selected corresponding upper and lower mounting portions of said front and rear sections with which said anchor means are horizontally aligned upon relative longitudinal displacement between said center sections and said front and rear sections for releasable and substantially rigid anchoring to said upper and lower mounting portions, said upper deck being substantially horizontally aligned with said upper deck portions when said anchor means are anchored relative to said upper mounting portions and spaced appreciably below said upper deck portions when said anchor means are anchored relative to said lower anchor portions.

4,290,643
FOLDING CHAIR

William F. Logan, 3rd., 1329 Marlborough Ave., Plainfield, N.J. 07060

Filed Jan. 26, 1979, Ser. No. 6,782
Int. Cl.[3] A47C 4/28
U.S. Cl. 297—16 **3 Claims**



1. A folding chair formed of an integral support structure comprising, in combination, a central connection ring, eight compression members having inner ends pivotally connected to said central connection ring and outer ends, a first and a second of said compression members having their inner ends pivotable on said ring and extending forwardly and downwardly, a third and a fourth of said compression members having their inner ends pivotable on said ring about axes which coincide with the axes of pivotal connection to the ring of the first and second compression members, extending rearwardly and downwardly, said outer ends of said downwardly extending compression members resting on the floor, a fifth, a sixth, a seventh and an eighth of said compression members having their inner ends pivotable on said ring and extending upwardly and having outer ends generally above the outer ends of said downwardly extending compression members, the fifth and sixth compression members extending forwardly and in a common plane with the third and fourth compression members, said common plane being perpendicular to the plane of the ring, and the seventh and eighth compression members extending rearwardly, four collapsible tension members connecting the outer ends of said downwardly extending compression members and two generally vertical collapsible tension members connecting the outer ends of said rearwardly extending compression members, a seat of collapsible sheet material having a back edge connected between the outer ends of said rearwardly and upwardly extending compression members, and side edges forming arms each connected between the outer ends of an upwardly and rearwardly extending compression member and an upwardly and forwardly extending compression member, said seat being concave, collapsible means connecting the outer end of each forwardly and downwardly extending compression member to the outer end of the forwardly and upwardly extending compression member there-

above, and means disconnecting the collapsible tension member which connects the third and fourth compression members so that said compression members pivot together about said central connection ring folding said chair, and wherein the inner ends of the third and fourth compression members are each provided with respective toothed inward extensions which interengage at opposite sides of the inner ends of the third, fourth, fifth and sixth compression members to restrict pivotal movement to said common plane, whereby the ring is stabilized against tilting about diametrical axes thereof, and said collapsible means connecting the outer ends of each forwardly and downwardly extending compression member to the outer end of the forwardly and upwardly extending compression member thereabove is a forward extension of said seat, said forward extensions of said seat being connected to said outer ends of said forwardly and downwardly extending compression members.

4,290,644

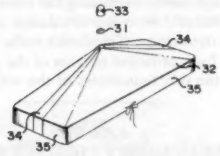
RECESS-VENTILATED COLLAPSIBLE TENT MOTORCYCLE SEAT

Jinn-Yih Hu; Kun-Si Hu, and Sue-Jan Hu, all of 3rd Fl., No. 74-2, Lan-Chu St., Taipei, Taiwan

Filed Dec. 5, 1979, Ser. No. 100,276

Int. Cl.[3] B60J *7/20*; B62J *1/18*

U.S. Cl. 297—195 **1 Claim**



1. A recess ventilated collapsible tent motorcycle seat, a small wedge being mounted towards the front of said recess; in the middle of said recess, an erectable and collapsible mounting rod being provided, from which mounting rod is attached suspended a small heat-, rain- and dust-resistant tent on which tent are attached strips of relatively thicker material which can cover the entire mechanism when the tent is collapsed into the ventilation recess; which tent when erected leaves open a portion of the end of the ventilating recess to permit the flow of air, the ventilation recess having a plurality of venting holes in its bottom to permit further flow of air so as to render the tent heat resistant.

4,290,645

STACKING CHAIR

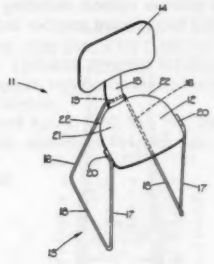
Michael Glickman, and Geoffrey A. Hollington, both of London, England, assignors to Pel Limited, Oldbury, England

Filed Jan. 17, 1980, Ser. No. 112,940

Int. Cl.[3] A47C *3/04*

U.S. Cl. 297—239 **3 Claims**

1. A stacking chair comprising a seat (**12**), a backrest (**14**) connected to the rear edge of the seat, a frame for supporting the seat and including a pair of front legs (**17**) which are parallel to one another, and a pair of rear legs (**16**) which are inclined outwardly and downwardly, the rear portion (**21**) of the seat decreasing in width towards the rear of the chair, the seat width at the front of the said rear portion (**21**) being greater than the separation between the rear legs (**16**) at their upper ends and the maximum seat width at the rear of the said rear portion (**21**) being equal to the separation between the rear legs (**16**) at their upper ends so that a camming action occurs between the seat of one chair and the rear legs of a chair placed



downwardly thereover to thereby move the last named chair rearwardly during stacking.

4,290,646

INCLINABLE CHAIR

Hans J. Edel, Wittekindallee 17, D-4950 Minden, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,612

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846126

Int. Cl.[3] A47C *1/02*

U.S. Cl. 297—327 **17 Claims**

1. An improved inclinable chair, comprising:
a support frame;
a seat frame pivotably supported by said support frame for inclination about a horizontal axis;
laterally movable lever means pivotably mounted on said seat frame; and
cam means comprising a laterally extending inclined slot mounted on said support frame in position for said lever means to extend through said slot, for causing said inclination of said seat frame to occur as said lever means moves with respect to said slot.

4,290,647

HINGE MOUNT ASSEMBLY FOR RECLINABLE SEAT

Wolfgang Hensel, Langenfeld; Hans-Joachim Berghof, and Heinz Werner, both of Remscheid, all of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. K.G., Remscheid, Fed. Rep. of Germany

Filed Oct. 3, 1979, Ser. No. 81,447

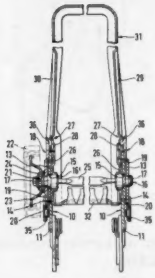
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 7830544[U]

Int. Cl.[3] A47C *1/025*

U.S. Cl. 297—362 **7 Claims**

1. A hinge mount assembly for seats, particularly motor vehicle seats having a seat component and a reclinable backrest component, comprising a fixed hinge mount member secured to a lateral side of the seat component; a tiltable hinge mount member secured to the backrest component; a transverse pivot axle defining an intermediate eccentric portion and lateral concentric portions, said eccentric portion bearing on the fixed

hinge mount member and one of said concentric portions supporting the tiltable hinge mount member, an attachment frame for the backrest component secured to said tiltable hinge mount member; a position adjuster including an outer gear formed on said fixed hinge mount member and an inner gear



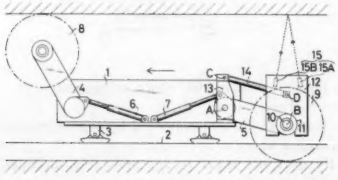
formed on said tiltable hinge mount member, said inner gear exceeding in diameter said outer gear and being in mesh therewith; and a bearing plate supported on the other concentric portion of the pivot axle and being connected to said attachment frame.

4,290,648

MINING APPARATUS

Ken Takahashi, Tokyo, and Tsunetoshi Ito, Yokohama, both of Japan, assignors to Taiheiyo Engineering Inc., Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,455
Claims priority, application Japan, Jun. 25, 1979, 54-79043
Int. Cl.[3] E21C *27/24, 35/08*
U.S. Cl. 299—1 **13 Claims**



1. A mining apparatus comprising
(A) an apparatus body,
(B) a drum rotating shaft,
(C) a board connected to said rotating shaft,
(D) a linking bar pivotably connecting said apparatus body with said board,
(E) a position detection device mounted on said board comprising at least one projector and at least one receiver,
said position detection device measuring the position of said apparatus in a mine by receipt of projected signals reflected off an edge of said mine.

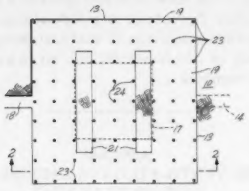
4,290,649

METHOD FOR EXPLOSIVELY EXPANDING A PILLAR FOR FORMING AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Nov. 7, 1979, Ser. No. 92,173
Int. Cl.[3] E21C *41/10*
U.S. Cl. 299—2 **44 Claims**

1. A method for forming an in situ oil shale retort in a retort site in a subterranean formation containing oil shale, the in situ oil shale retort containing a fragmented permeable mass of formation particles within the boundaries of the retort comprising the steps of:
excavating at least one horizontally extending void within the boundaries of an in situ oil shale retort site leaving zones of unfragmented formation above and below such a void and leaving at least one pillar of unfragmented formation within the side boundaries of such a void for providing temporary support for overlying formation above the void;
placing explosive in such a pillar, the amount of explosive being sufficient to eject a principal portion of fragments of the pillar to at least the side boundaries of the void;



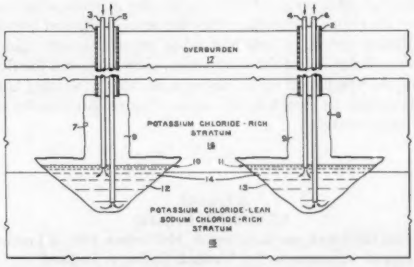
placing explosive in at least one such zone of unfragmented formation;
detonating explosive in the pillar for explosively expanding the pillar and ejecting pillar fragments towards side boundaries of the void; and
detonating explosive in such a zone of unfragmented formation for explosively expanding the zone towards the void, the time interval between detonation of explosive in the pillar and detonation of explosive in the zone being at least sufficient for a principal portion of the pillar fragments to travel to the side boundaries of the void.

4,290,650

SUBTERRANEAN CAVITY CHIMNEY DEVELOPMENT FOR CONNECTING SOLUTION MINED CAVITIES

Robert E. Thompson, Moose Jaw, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Aug. 3, 1979, Ser. No. 63,220
Int. Cl.[3] E21B *43/28*
U.S. Cl. 299—4 **13 Claims**



1. A method of connecting two subterranean cavities in a deposit having a potassium chloride-rich stratum that contains sodium chloride and which is disposed above a potassium chloride-lean, sodium chloride-rich stratum, which comprises the steps of:
(a) drilling adjacent boreholes into the sodium chloride-rich stratum,
(b) forming a substantially cylindrical chimney in each borehole by injecting aqueous solvent unsaturated with respect to sodium chloride and potassium chloride into the bottom of the borehole and withdrawing solvent enriched in potassium chloride and sodium chloride from the borehole at a level in the deposit that is at least the lowest level

at which connection of the cavities is to be effected, said chimney having a diameter larger than the initial borehole and a volume sufficient to prevent inadvertent reduction in thickness during cavity development of the water-immiscible, non-solvent liquid blanket established in step (c),

(c) introducing water-immiscible, non-solvent liquid having a density lower than the aqueous solvent into said chimneys, therby establishing a reservoir and blanket of said non-solvent on top of the aqueous solvent in said chimneys,

(d) introducing aqueous solvent into said chimneys below the surface of said blanket and withdrawing enriched solvent from near the bottom of the chimney, thereby expanding the chimneys laterally adjacent to the bottom of the non-solvent blanket and forming subterranean cavities,

(e) continuing to expand said cavities in the manner described in step (d) while raising the level of the non-solvent blanket in the cavities incrementally as the cavities expand laterally, thereby forming inverted cone-shaped cavities, and

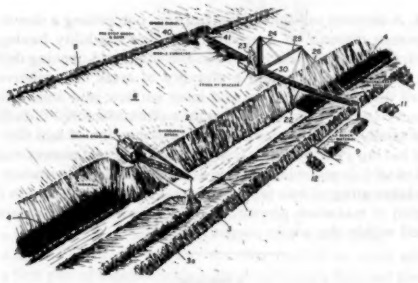
(f) further expanding the cone-shaped cavities laterally while maintaining the non-solvent blanket in the adjacent cavities at about the same level until the cavities connect.

4,290,651

SURFACE MINING METHOD

Thomas I. Files, Marion, Ohio, and Donald H. Beutner, Newburgh, Ind., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 3, 1979, Ser. No. 26,638
Int. Cl.³ E21C *41/00*
U.S. Cl. 299—7 **5 Claims**



1. A method of surface mining along an elongated pit exposing a strip of the mineral seam between two opposed banks, using a cross-pit transporter having a conveying means extending completely across the pit and an overburden excavator moveable along the working bank of the pit within the normal working path of the cross-pit transporter comprising the steps of:

a. progressively excavating the topsoil layer along the working bank of the pit;

b. separately and progressively excavating the remaining overburden along said working bank using the overburden excavator and transferring the excavated overburden material and depositing it in spoils piles along the opposite bank of the pit;

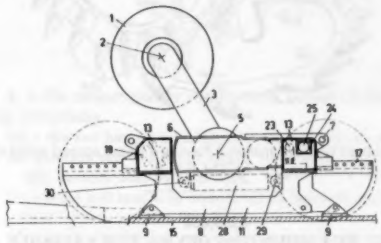
c. separately transporting the topsoil directly across and over the pit using the cross-pit transporter and depositing such topsoil selectively with respect to said overburden material on the opposite bank while pivotably supporting said conveying means solely from one bank, whereby said cross-pit conveying means is occasionally pivoted to a non-interfering position to permit passing of said overburden excavator to change the relative positions of the two machines.

4,290,652

MACHINE FOR THE CUTTING OF ROCKS IN UNDERGROUND WORKS

Marie G. J. Legrand, Minderbroedersstraat 28, B - 3550 Heusden-Zolder, Belgium

Filed Apr. 1, 1980, Ser. No. 136,407
Claims priority, application Belgium, Apr. 13, 1979, 27726
Int. Cl.³ E21C *27/24*
U.S. Cl. 299—45 **15 Claims**



1. Machine for cutting rocks in underground works, comprised of:

a slide way,

a carriage on said slide way,

means to move the carriage on said slide way,

a machine frame hinged relative to said carriage about a first axis at right angle to the lengthwise direction along which extends the slide way,

means imparting to said machine frame a swinging movement about said first axis relative to the carriage,

an arm hinged relative to the machine frame about a second axis in parallel relationship with said first axis,

means imparting to said arm a swinging movement about the second axis relative to the machine frame,

a cutting drum mounted relative to said arm, which rotates about a drum axis in parallel relationship with said first axis and second axis, and

means to rotate said cutting drum about the drum axis,

in which the sizes of the cutting drum, the arm, the machine frame and the carriage as well as the swinging motions imparted to the machine frame relative to the carriage and to the arm relative to the machine frame are so selected that the single cutting drum can be swung so far out at both ends of the slide way in the lengthwise direction thereof, that no single component extends further away in such a way that the cutting drum can cut free the machine at both ends of said slide way.

4,290,653

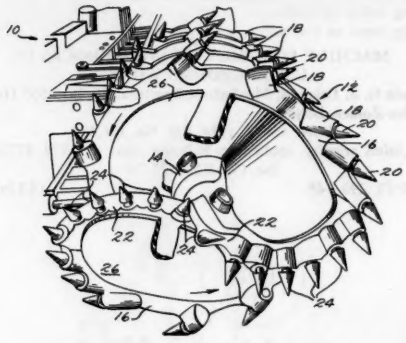
COAL MINING MACHINE CUTTER WITH NOISE SUPPRESSANT AND FLAME RESISTANT LAYER

Joseph V. Lagowski, Mabscott, W. Va., assignor to Fairchild Incorporated, Raleigh, W. Va.

Filed Jul. 30, 1979, Ser. No. 61,909
Int. Cl.³ E21C *35/04, 27/24*
U.S. Cl. 299—87 **6 Claims**

1. In a mining machine having a power driven cutter including metallic helical blade means having cutting bit means spaced along the exterior periphery thereof, the improvement which comprises said helical blade means having fixedly secured in surface-to-surface contact therewith energy absorbing layer means for dampening vibrations set up in the metal of said helical blade means when said cutter is in power operated

cutting relation so as to materially reduce the operating noise level of said cutter within the mine, said layer means being of



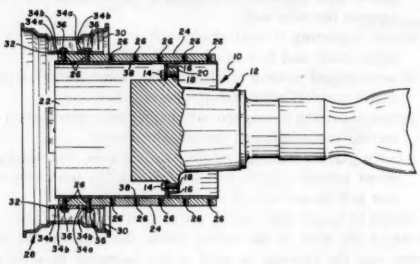
flame resistant resilient material having a flame spread index of less than 25 according to ASTM-E162.

4,290,654

WHEEL RIM MOUNTING DEVICE FOR VARIABLE WHEEL SPACING

David S. Majkrzak, West Fargo, and Dwight B. Hinkel, Fargo, both of N. Dak., assignors to Steiger Tractor, Inc., Fargo, N. Dak.

Filed Nov. 5, 1979, Ser. No. 91,589
Int. Cl.³ B60B *23/12*
U.S. Cl. 301—9 TV **12 Claims**



1. A wheel rim and a mounting device therefore for use with a conventional wheel hub attached to an axle of an off-the-road vehicle for making possible variations in the spacing between wheel rims, said rim and mounting device comprising:

a cylindrical sleeve with an outer surface and an inner surface for attachment to a conventional wheel hub, said cylindrical sleeve having a plurality of rows of outwardly facing threaded apertures, the rows of apertures being positioned in a longitudinal axial direction;

a wheel rim with an inner surface;

a plurality of bracket means circumferentially spaced and rigidly attached to the inner surface of the wheel rim, each of said bracket means having an aperture therethrough alignable with a corresponding threaded aperture of the cylindrical sleeve,

each of said bracket means being in the form of a U-shaped bracket having two end leg portions rigidly attached to the inner surface of the wheel rim and a base portion through which the aperture extends, the dimensions of said leg members of said bracket means being such that when no tension is exerted upon the base portions, the base portions of opposed brackets are spaced apart greater than the distance between adjacent points of the cylindrical sleeve so that the wheel rim will freely slide axially on the sleeve when the base portions are not under tension; and

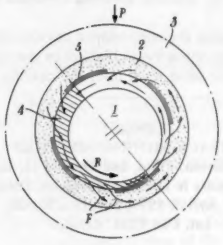
a screw threaded fastening means extending through the bracket means and threadedly engaging at least one of the threaded apertures of the cylindrical sleeve for securing the wheel rim to the cylindrical sleeve, the U-shaped brackets being sufficiently flexible that when said fastening means are tightened the base portions are drawn into engagement with the sleeve for firmly securing the rim to the sleeve.

4,290,655

SINTERED SELF LUBRICATING BEARINGS

Gennaro Apuzzo, and Gian F. Bocchini, both of Naples, Italy, assignors to Merisinter S.p.A., Arzano, Italy

Filed May 15, 1979, Ser. No. 39,569
Claims priority, application Italy, Jun. 6, 1978, 49737 A/78
Int. Cl.³ F16C *17/02, 33/10*
U.S. Cl. 308—121 **4 Claims**



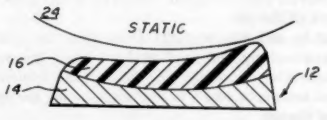
1. A sintered self-lubricating bearing, comprising a sleeve of a porous material of a predetermined permeability having a central opening to receive a rotatable shaft, said opening defining an inner surface; and a plurality of areas of a relatively small thickness located on said inner surface, said areas being equally spaced from each other in a circumferential direction and axially extended along an axis of elongation of said sleeve, and having a permeability lower than that of said porous material of said sleeve, whereby said areas reduce the penetration of the lubricating oil into said porous material of said sleeve in the region of maximum pressure and also allow a free circulation of oil within the whole porous sleeve.

4,290,656

HYDRODYNAMIC BEARING WITH EXTENDED PRESSURE GRADIENT

Thomas L. Daugherty, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1979, Ser. No. 88,728
Int. Cl.³ F16C *17/14, 33/22*
U.S. Cl. 308—121 **9 Claims**



1. A water lubricated marine bearing comprising:

a housing having a cylindrical opening therethrough and a plurality of stave pads annularly disposed about the opening for carrying a rotatable shaft extending therethrough;

each stave pad including a rigid backing member adapted to be secured to the housing and a cap of resiliently deform-

able material facing inwardly defining a sliding load bearing surface for the rotatable shaft;

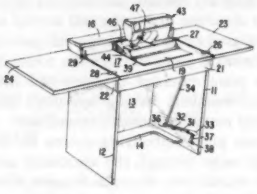
each stave pad including means extending thereacross substantially from its leading edge to its trailing edge whereby the resilient cap in carrying the shaft is conformed across substantially its entire width to the curvature of the shaft and has pressure induced therein which reacts against the shaft as a force defined by a pressure profile which increases progressively across substantially the entire face of the resilient cap from leading edge to trailing edge for aiding the maintenance of a wedge of water lubricant between the cap and rotating shaft.

4,290,657

SEWING CABINET WITH VERTICALLY MOVABLE TABLE

Robert V. Haas, Edison, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 6, 1980, Ser. No. 118,899
Int. Cl.³ D05B *75/00;* A47B *51/00*
U.S. Cl. 312—21 **13 Claims**



1. A cabinet structure comprising:

first and second side support members spaced apart a fixed distance;

a work table extending transversely between the first and second side members and movable vertically between an upper position and a lower position;

a first bracket to support one end of the work table;

a second bracket to support the other end of the work table;

a first pair of support arms each comprising a first end pivotally attached to the first support member and a second end pivotally attached to the first bracket, the arms being pivotally moving substantially parallel to each other;

a second pair of support arms substantially the same length as the first pair of arms, respectively, and each comprising a first end pivotally attached to the second support member and a second end pivotally attached to the second bracket, the arms of the second pair being pivotally movable substantially parallel to each other;

pressure means connected to the arms of the first pair to pivot the first pair of arms between first positions in which the first bracket supports one end of the work table in its upper position and a second position in which the first bracket supports said one end of the work table in its lower position;

connecting means connecting the arms of the first pair with the arms of the second pair to pivot the arms of the second pair simultaneously with the arms of the first pair to support the other end of the work table in corresponding upper and lower positions; and

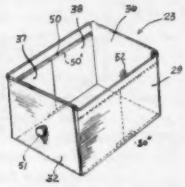
latching means to hold both of the brackets in a position in which the table means is elevated to its upper position.

4,290,658

DRAWER FILE CABINET

Dennis De Rosa, 267 E. Wrightwood, Glendale Heights, Ill. 60137

Filed Sep. 21, 1979, Ser. No. 77,750
Int. Cl.³ B65D *5/24*
U.S. Cl. 312—108 **2 Claims**



1. A file cabinet drawer formed from a sheet of blank material comprising,

(a) a drawer having a rectangular shaped bottom wall,

(b) exterior side walls connected to opposite side edges of said bottom wall by fold lines,

(c) a front and rear wall connected to opposite end edges of said bottom wall by fold lines,

(d) corner connecting means between said side walls and said front and rear walls adapted to be folded into facial abutment with the interior surface of said front and rear walls,

(e) said corner connecting means including foldable flaps connected to certain end edges of said side walls and said front and rear walls with said flaps divided into equal sections by diagonal fold lines extending therethrough from the junction of certain fold lines of said front and rear walls and adapted to be folded inwardly of the drawer over said front and rear walls,

(f) insert means connected to certain end edges of said front and rear walls and foldable inwardly of the drawer over said corner connecting means,

(g) means provided by said insert means foldable into facial abutment with the interior surface of said side walls to form interior side wall panels when said flaps are folded inwardly of the drawer, and

(h) means provided by said interior side wall panels comprising an exposed straight horizontally extending edge lying in a horizontal plane below the exposed edges of said exterior side walls of said drawer for supporting file carriers thereon within said drawer.

4,290,659

CABINET SYSTEM

Hidetoshi Yoshiyuki, Bridgewater, N.J., assignor to Takara Company, Somerset, N.J.

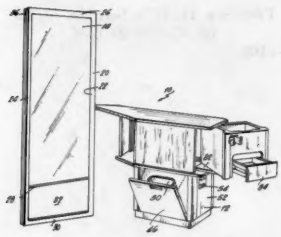
Filed Mar. 21, 1980, Ser. No. 132,384
Int. Cl.³ A47B *67/00;* G02B *5/08*
U.S. Cl. 312—224 **17 Claims**

1. A cabinet system comprising;

a standing cabinet,

a mirror standing adjacent to said cabinet, and adjustable connection means joining said cabinet to said mirror for changing the angle between said cabinetwherein said cabinet includes a body structure having a body member extending therefrom, said body member having said adjustable connection means affixed thereto, and wherein said mirror has a frame member formed with a groove in

one edge of the frame member for receiving said adjustable connection means, and wherein the angle between



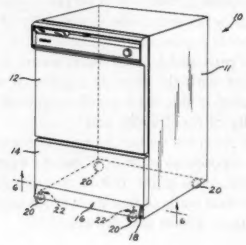
the mirror and cabinet is changed with the mirror and cabinet standing.

4,290,660

MOVABLE TOEKICK FOR CONVERTIBLE DISHWASHER

Bernard J. Brezosky, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 3, 1979, Ser. No. 99,261
Int. Cl.[3] A47B *77/08, 91/00*
U.S. Cl. 312—253 **11 Claims**



1. A movable toekick arrangement for a domestic appliance having a cabinet, and an access door at the front of the cabinet, said arrangement comprising:

support members mounted to the cabinet near the front thereof and rotatable between a forward position and a rearward position, in the forward position said support members intersecting the vertical plane of the front of the cabinet;

a toekick panel movably mounted to the cabinet at the lower front thereof for pivotal movement between a first position generally in the frontal plane of the cabinet and a second position projecting outwardly and upwardly from the cabinet at an angle to the frontal plane, said panel being operative to substantially hide said support members from view;

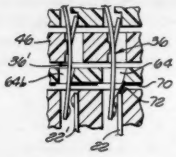
said support members being operative to engage said toekick panel in its first position and to pivotally move said toekick panel to its second position as said support members rotate from their rearward position to their forward position.

4,290,661

PROGRAMMABLE ELECTRICAL CONNECTOR

Edgar Burns, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 11, 1980, Ser. No. 111,329
Int. Cl.[3] H01R *25/00*
U.S. Cl. 339—18 R **15 Claims**



1. An electrical connector comprising:

a first connector member having a first set of movable contacts therein;

a second connector member having a second set of fixed contacts therein, each contact in said second set being associated with one of the contacts in said first set;

the associated contacts of said first and second sets of contacts being positioned laterally adjacent to but spaced from each other when said connector members are initially mated;

means for laterally shifting said first set of contacts in tandem in a direction to engage said second set of contacts, said associated contacts, if engaged, providing predetermined electrical paths through the connector;

a program plate mounted between said first and second connector members having apertures therein through which said movable contacts extend; and

said program plate embodying means for controlling the electrical paths through the associated contacts of said first and second sets of contacts upon activation of said contact shifting means.

4,290,662

CONNECTOR ASSEMBLY WITH VISUAL, TACTILE AND AUDIBLE INDICATION

Joseph A. Storcel, North Riverside, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

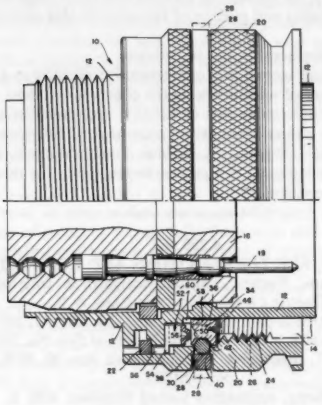
Filed Jul. 11, 1979, Ser. No. 56,663
Int. Cl.[3] H01R *4/30*
U.S. Cl. 339—89 M **35 Claims**

1. In a connector assembly which includes first and second connector members adapted for mating engagement;

a coupling member for drawing said connector members into mating engagement; and

indicating means associated with said coupling member and at least one of said connector members for movement between a first non-indicating position and a second indicating position in response to a predetermined positional

relationship of said connector members, said indicating means when in one of said positions being disposed outside



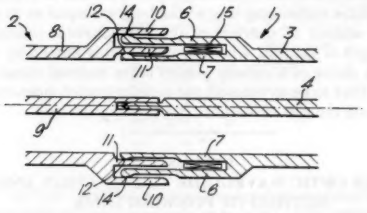
of and substantially entirely surrounding the peripheral bounds of the coupling member.

4,290,663

IN HIGH FREQUENCY SCREENING OF ELECTRICAL SYSTEMS

Eliot P. Fowler, Tolpuddle, and John R. Taylor, Wool, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 23, 1979, Ser. No. 87,480
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **8 Claims**



4. A method of electrically connecting the outer conductor of a screened co-axial cable to a co-axial connector or to a terminal, the method comprising making at least two connections between the outer conductor of the cable and the connector or component terminal and interposing between said at least two connections a magnetic toroid for reducing the magnetic reluctance between said at least two connections.

4,290,664

MULTIPLE OUTLET TELEPHONE LINE ADAPTER

Robert W. Davis, New Hope, Minn., and Paul D. Tracy, Lawrenceville, Ill., assignors to Communications Systems, Inc., Hector, Minn.

Filed Sep. 28, 1979, Ser. No. 80,154
Int. Cl.³ H01R *13/506*
U.S. Cl. 339—156 R **5 Claims**

1. A bridge adaper assembly for a communication system having a plurality of communication line sets, each consisting of a plurality of conductors comprising:

a housing comprising upper and lower identical halves having first and second generally rectangular major surfaces generally parallel to one another, first and second generally rectangular side walls, and first and second generally rectangular end walls, the upper half comprising the first major surface and half of the first and second side walls and half of the first and second end walls, and the lower half comprising the second major surface and half of the first and second side walls and half of the first and second end walls;

the openings in the first and second side walls and the first and second end walls each having an opening defined therein and each opening being formed partially in the upper half and partially in the lower half of the housing;

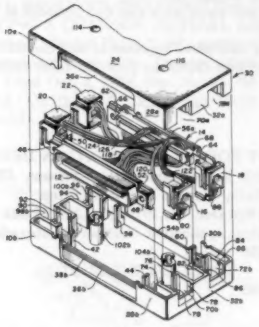
first multiple contact connector means mounted in an opening in the first side wall and having contacts for connection to more than one communication line set;

second multiple contact connector means mounted in an opening in the second side wall and having contacts for connection to more than one communication line set;

said first and second multiple contact connector means having flanges on the edges thereof, and being retained in the respective openings in either of two positions, each rotated 180° from the other position;

first and second modular connector means each having flanges on the edges thereof and each modular connector means being coupled to contacts for one communication line set of the multiple contact connector means;

first inner walls within the housing halves and proximate the opening in the first end wall, the first inner walls defining



a first pocket for slidably receiving and holding the first modular connector means;

second inner walls within the housing halves and proximate the opening in the second end wall, the second inner walls defining a second pocket for slidably receiving and holding the second modular connector means;

snap lock means for connecting together the top and bottom halves of the housing comprising first and second posts projecting from an inner surface of the first major surface, the first and second posts each having a lip and groove proximate their free ends, third and fourth connecting posts projecting from an inner surface of the second major surface, the third and fourth posts each having a lip and groove proximate their free ends, wherein the first and second posts and the third and fourth posts are positioned within the housing so that the lip and groove of the first post cooperate with the lip and groove of the third post, and the lip and the groove of the second post cooperate with the lip and groove of the fourth post to connect and hold together the upper and lower halves of the housing; and

conductor means within the housing for connecting a plurality of communication line sets between the first and second multiple contact connector means, said conductor means having sufficient length to permit one of the multiple contact connector means to be rotated between its two positions.

4,290,665

METHOD OF MANUFACTURING A CONTACT CLIP

Valery A. Krasnov, Profsojuznaya ulitsa, 79, korpus 5, kv. 100; Yakov A. Klovsky, Scherbakovskaya ulitsa, 7, kv. 44.; Igor V. Dubov, 6 Parkovaya, 13, kv. 76.; Arkady V. Shtern, Veshnyakovskaya ulitsa, 27, korpus 3, kv. 130, all of Moscow; Viktor L. Vyatkin, poselok Tovarkovsky, ulitsa Kirova, 5, kv. 2., Bogoroditsk Tulskoi oblasti, and Lev A. Shavelzon, ulitsa Junykh Lenintsev, 95/13, korpus 1, kv. 24, Moscow, all of U.S.S.R.

Filed Sep. 25, 1979, Ser. No. 78,902
Int. Cl.[3] H01R *11/08, 43/02*
U.S. Cl. 339—276 T 4 Claims

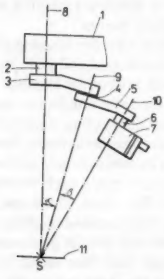
1. A process for manufacturing a contact clip, comprising the steps of:
providing an aluminum body part having a planar end surface;
providing an initially separate copper-clad aluminum lug part having a copper-free planar end surface adapted to abut the planar end surface of said body part;
at least one of said parts having a projection adjacent the planar end surface thereof;
positioning said parts with said end surfaces in mutual abutment; and
butt welding said parts together at said end surfaces, so that said projection flows to provide filler material for the weld.

4,290,666

JOINT FOR AN OBSERVATION DEVICE

Reinhard Rüdel, 8, Hermann-Matern-Strasse, JENA-Lobeda, District of Gera, German Democratic Rep.

Filed Dec. 11, 1979, Ser. No. 96,303
Claims priority, application German Democratic Rep., Nov. 24, 1928, 209288
Int. Cl.[3] G02B *7/24, 23/16*
U.S. Cl. 350—85 3 Claims



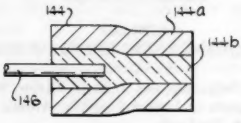
1. A joint for an observation device comprising
a device mount,
at least two joint members,
an observation device,
a first pivot, a second pivot and a third pivot,
said first pivot having a non-displaceable axis of rotation substantially at right angles relative to the object plane,
said second pivot having a first displaceable axis of rotation,
said third pivot having a second displaceable axis of rotation,
said first pivot seating for rotation one of the two joint members via one end portion of the latter relative to said mount,
said second pivot seating for rotation via one end portion the other of the two joint members to the other end portion of said one joint member,
said third pivot seating for rotation said other joint member via the other end portion of the latter to said observation device,
said non-displaceable axis of rotation,
said first and second axis of rotation intersecting in a common point of intersection in the observation plane,
said non-displaceable axis of rotation and said first axis of rotation, and said first axis of rotation and said second axis of rotation, respectively, include a constant angle, and
means for directing an observation beam within the members mentioned hereinbefore.

4,290,667

OPTICAL FIBRE TERMINATIONS AND CONNECTORS

Martin Chown, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 842,516, Oct. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 763,255, Jan. 26, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 920,921
Claims priority, application United Kingdom, Feb. 3, 1976, 04174/76; Oct. 19, 1976, 43319/76; Jul. 5, 1977, 28067/77
Int. Cl.[3] G02B *5/14*
U.S. Cl. 350—96.18 11 Claims



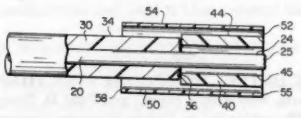
1. A graded index expanded beam optical fibre termination, including a socket having a blind hole for accepting the end of an optical fibre, which hole is aligned with the axis of a radially graded index collimating lens whose length is equal to an odd integral number of quarters of the characteristic sinusoidal wavelength of the lens, wherein said socket is formed by collapsing a sleeve of a radially graded index material about the end of a fibre to be terminated, the radially graded index material beyond the end of the fibre end forming the lens.

4,290,668

FIBER OPTIC WAVEGUIDE TERMINATION AND METHOD OF FORMING SAME

Roger H. Ellis, Atherton, and Raymond Clarke, Mt. View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 29, 1978, Ser. No. 964,506
Int. Cl.[3] G02B *5/14*
U.S. Cl. 350—96.20 24 Claims



1. An optical waveguide comprising:
a glass fiber core possessing at least one polished end surface and a substantially cylindrical exterior surface;
a polymeric cladding disposed on and around said exterior surface of said core, said cladding having a refractive index numerically lower than the refractive index of said exterior surface of said core;
a first polymeric sleeve having a refractive index numerically lower than the refractive index of said exterior sur-

face of said core, and possessing an inner surface disposed around and directly bonded to a portion of said exterior surface of said core adjacent said at least one polished end surface from which the surrounding portion of said polymeric cladding has been removed, an outer surface and a pair of annular end surfaces one of which abuts the unremoved portion of said polymeric cladding and the other of which is substantially flush with said at least one polished end surface; and

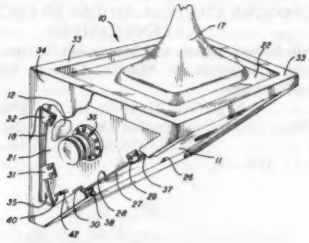
a second polymeric sleeve of greater longitudinal length than said first sleeve, said second sleeve possessing an inner surface, a portion of which is telescopically disposed around and bonded to said outer surface of said first sleeve, an outer surface and a pair of annular end surfaces, one of which is substantially flush with said at least one polished end surface and the other of which is disposed around said polymeric cladding whereby, the junction between the first sleeve and the unremoved portion of the polymeric cladding is strain relieved and the polished end surface is substantially centered and mechanically restrained from any motion relative to the outer surface of the second sleeve, all without substantial degradation of the light propagating capability of the waveguide.

4,290,669

OPTICAL DISPLAY APPARATUS

George M. Belva, Vestal, and Richard A. Mecklenborg, Binghamton, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,299
Int. Cl.[3] G02B *27/14*
U.S. Cl. 350—174 **4 Claims**



1. An optical reflector visual display system comprising:

beamsplitter means to divide an incident image-bearing light beam in a predetermined manner,

a reflective surface forming a predetermined angle with said beamsplitter means,

means to form a gas-tight seal between said beamsplitter means and said reflective surface,

end surface means forming closures at the ends of said beamsplitter means and reflective surface to define a space,

top surface means forming a closure across the remaining opening of said beamsplitter means, said reflective surface and said end surface means,

said top surface means being in the form of a relatively thin membrane which is effective to close the remaining opening and seal it hermetically,

said means to form a gas-tight seal between said beamsplitter means and said reflective surface extends also around all joints between said end surface means and said top surface means,

gas means substantially filling said space formed by said beamsplitter means, reflective surface and end surface means so that the reflective surfaces of both said beamsplitter means and said reflective surface are covered by said gas means,

flexible expansion chamber means connected to the space defined by said beamsplitter means and the various surface means to allow for expansion and contraction of said gas means;

CRT means positioned with its image-bearing surface adjacent the top surface means,

contact fluid means between said image-bearing surface and said top surface means to form a substantially continuous refractive medium as a molecular, optical contact between the surface of said CRT means and said top surface means,

said means to form a gas-tight seal including both gasket means and clamping means to draw the surfaces tightly together,

metallic frame means about said beamsplitter means, said reflective surface, said end surface means and said top surface means to form a rigid support structure.

separate end closure means over said frame means to cover both ends separate from said end surface means,

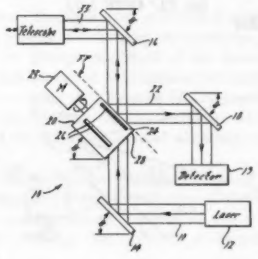
rear surface means separate from said reflective surface to cover the space behind said frame means so that said frame means is substantially enclosed separately.

4,290,670

OPTICAL RECEIVER/TRANSMITTER SYSTEM EMPLOYING A COMMON OPTICAL APERTURE

Wesley D. Gerber, Mission Diejo, Calif., assignor to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Oct. 3, 1979, Ser. No. 81,718
Int. Cl.[3] G05D *25/00;* G01C *3/08;* G02B *7/88*
U.S. Cl. 350—274 **7 Claims**



1. A system for alternately projecting and receiving electromagnetic radiation through a single optical aperture comprising:

means for emitting a beam of electromagnetic radiation along a first optical path;

first means for focusing said beam at a focal plane along the first optical path;

means at said focal plane for gating said focused beam for a first predetermined period of time;

second means for collimating said gated beam towards said optical aperture for projection thereby and for focusing radiation received by said optical aperture to said focal plane;

said gating means includes a negative cylinder reflector element for reflecting said focused received radiation at said focal plane along a second optical path for a second predetermined period of time subsequent to said first predetermined period of time;

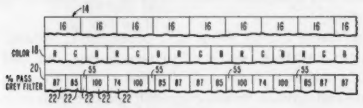
third means located along said second optical path for collimating said reflected received radiation; and

means for detecting said received radiation from said third means.

4,290,671
COLOR ENCODING FILTER

Roland N. Rhodes, Belle Mead, N.J.; Alfred C. Schroeder, Southampton, Pa., and Warren H. Moles, Flemington, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,722
Int. Cl.[3] G02B 5/20; H04N 9/07
U.S. Cl. 350—317 8 Claims

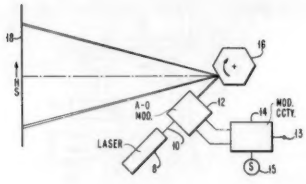


1. A filter for use with an image pick-up device having a plurality of columns of photosensors, said filter comprising: a plurality of vertical color filter stripes arranged in horizontally repeating cycles of color order and having a non-integral relationship with respect to said columns of photosensors; and means for controlling the amount of a particular color impinging upon a particular photosensor such that the fundamental and reduced undesired harmonics of the beat frequency between said columns and said stripes are generated in the resulting color signals from said photosensors.

4,290,672
PLURAL LINE ACOUSTO-OPTICALLY MODULATED LASER SCANNING SYSTEM

Rodney J. Whitefield, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,466
Int. Cl.[3] G02F 1/11
U.S. Cl. 350—358 6 Claims



1. A plural line acousto-optically modulated scanning system of the type wherein a light beam is deflected by acousto-optical modulating apparatus in one direction, and in another direction by deflecting apparatus for creating a dot sequential raster image display in a plurality of pairs of scan lines, comprising

apparatus for generating a beam of light,

light deflecting apparatus intercepting light from said generating apparatus for scanning said raster substantially simultaneously in at least one pair of scan lines for creating said image display,

acousto-optical modulating apparatus interposed between said light generating apparatus and said light deflecting apparatus for producing a plurality of individually modulatable scanning beams,

said modulating apparatus comprising

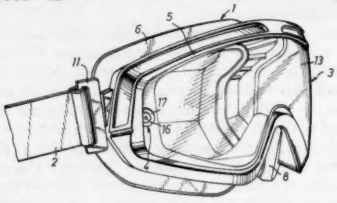
apparatus for propagating a pair of acoustic waves in directions substantially normal to the path of said beam of light but offset by the Bragg angle and also normal with respect to each other, and

apparatus for individually modulating each of said waves in accordance with data representative of the image to be displayed.

4,290,673
SKI GOGGLES

Tamenobu Yamamoto, Higashi-Osaka, Japan, assignor to Yamamoto Bojin Megane Co., Ltd., Higashi-Osaka, Japan

Filed Jan. 29, 1980, Ser. No. 116,598
Claims priority, application Japan, May 14, 1979, 54-59277
Int. Cl.[3] G02C 11/08; A61F 9/02
U.S. Cl. 351—62 6 Claims

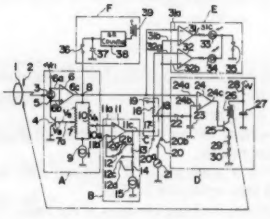


1. Ski goggles including a goggle lens comprising a pair of inner and outer lens plates and having a heat insulating interior space between the lens plates, the inner lens plate being formed with a pressure balancing air port close to an outer peripheral portion thereof, the ski goggles being characterized in that means is provided in opposed relation to the air port for preventing ingress of water into the interior space while permitting flow of air therethrough, the water ingress preventing means including a water-repellent air-permeable filter.

4,290,674
APPARATUS FOR ESTABLISHING AUTOMATIC EXPOSURE CONTROL MODES IN EXCHANGEABLE LENS CAMERA

Toshio Kobori, Sakai, and Masayoshi Sahara, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1979, Ser. No. 106,269
Claims priority, application Japan, Dec. 29, 1978, 53-163125
Int. Cl.[3] G03B 7/20, 17/18
U.S. Cl. 354—38 6 Claims



1. A lens exchangeable camera adapted for mounting an exchangeable lens having a diaphragm, a diaphragm presetting means settable to preset a diaphragm aperture size, and an aperture information transmitting means capable of transmitting respective first and second aperture information, said first aperture information representing that the diaphragm presetting means is preset at a minimum aperture size and said second aperture information representing each setting of the diaphragm presetting means other than the minimum aperture setting, said camera comprising:

a program exposure control circuit for generating signals adaptable to automatically control the diaphragm aperture size of said lens and to automatically control the shutter speed under a given program in accordance with scene brightness;

an aperture priority automatic shutter speed control circuit

for automatically controlling the shutter speed in accordance with scene brightness measured through the diaphragm aperture actually stopped-down to the aperture size preset by said diaphragm presetting means; and

change-over means for selective actuation of said program exposure control circuit and said aperture priority automatic shutter speed control circuit, said change-over means actuating said program exposure control circuit when said first aperture information is transmitted, and actuating said aperture priority automatic shutter speed control circuit when said second aperture information is transmitted.

4,290,675

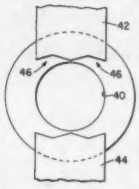
ANAGLYPH STEREOSCOPY

Leo Beiser, 151-77 28th Ave., Flushing, N.Y. 11354

Continuation-in-part of Ser. No. 966,054, Dec. 4, 1978, Pat. No. 4,222,653. This application Nov. 14, 1979, Ser. No. 93,979

Int. Cl.³ G03B *35/00, 9/02*

U.S. Cl. 354—112 **17 Claims**



1. An anaglyph stereoscopic imaging device having a lens system, at least one aperture stop, left and right complementary color filters near said aperture stop for creating images having preselected color fringes in the defocus regions, wherein each of said complementary color filters essentially transmits one portion of the spectrum of visual frequencies and blocks the remaining frequencies, and an iris for restricting the amount of light passing through said aperture stop substantially in a vertical direction only, said iris comprising a pair of blades movable vertically relative to each other, with the iris opening being defined by edges of said blades.

4,290,676

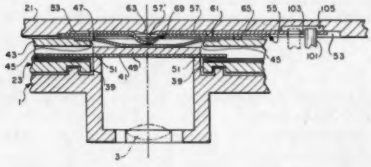
PRESSURE MEMBER URGING MECHANISM

Nelson D. Hozman; Robert L. Reynolds, and Thomas G. Kirn, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 31,266, Apr. 18, 1979, abandoned. This application Aug. 27, 1979, Ser. No. 69,678

Int. Cl.³ G03B *1/00, 17/00*

U.S. Cl. 354—121 **8 Claims**



1. Mechanism for urging a pressure member against a photographic film to locate an exposure area of the film in an exposure plane, said mechanism comprising:

a strip member having first and second portions spaced from each other and a flexible urging portion between said first and second portions, said strip member being adjustable to one configuration in which said first and second portions are separated by a given distance at which said urging portion is ineffective to urge the pressure member against the film and another configuration in which said first and second portions are separated by a lesser distance at which said urging portion is bowed toward the exposure plane to urge the pressure member against the film; and

means for engaging said first portion and moving it with respect to said second portion to change the spacing between said portions for adjusting said strip member from one of said two configurations to the other.

4,290,677

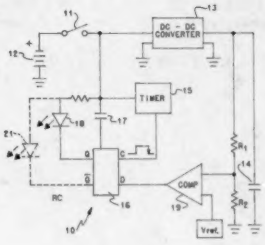
APPARATUS FOR CHECKING THE OPERATIONAL STATUS OF AN ELECTRONIC STROBE UNIT'S BATTERY UNDER LOAD CONDITIONS

Hans-Peter Baumeister, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 8, 1980, Ser. No. 184,725

Int. Cl.³ G03B *15/02*

U.S. Cl. 354—127 **6 Claims**



1. In a camera having a flash unit with a storage capacitor, and having a battery for charging the capacitor, apparatus for determining the charge condition of the battery during the charging of said capacitor, said apparatus comprising:

means for initiating the charging of said capacitor;

means for generating a reference voltage which is a predetermined fraction of a desired charging voltage of said capacitor;

means for measuring the charging voltage of said capacitor a predetermined time after initiation of charging, said time being a predetermined fraction of the time nominally required to charge said capacitor to its desired charging voltage;

an energizable indicator; and

means for comparing the measured voltage to the reference voltage and for energizing said indicator if the measured voltage bears a predetermined relationship to the reference voltage.

4,290,678

PIEZOELECTRIC FLASH-READY INDICATOR FOR PHOTOGRAPHIC CAMERA

Michael A. Marcus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

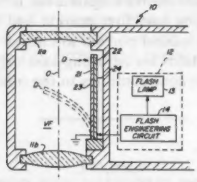
Filed Sep. 2, 1980, Ser. No. 182,896

Int. Cl.³ G03B *15/02, 17/20*

U.S. Cl. 354—128 **12 Claims**

1. In a photographic camera comprising a housing, circuit means, including a charge storing element, for selectively energizing a flashlamp, such circuit means including means for charging such element to a predetermined level sufficient to ignite the flashlamp, and means for indicating to the camera user when the charge stored by the charge storing element has reached such predetermined level, the improvement wherein

said indicating means comprises a piezoelectric flexure device, operatively coupled to said charge storing element, said device

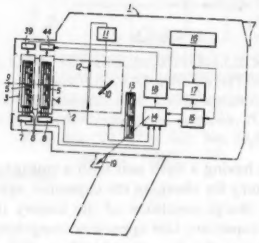


being adapted to change its shape in accordance with the level of charge stored by said charge storing element.

4,290,679
CAMERA

Peter Vockenhuber, Orges, Switzerland, assignor to Bolex International SA, Ste-Croix, Switzerland

Filed Jan. 23, 1979, Ser. No. 5,736
Claims priority, application Switzerland, Jan. 31, 1978, 1035/78
Int. Cl.³ G03B *3/08, 13/18, 17/18*
U.S. Cl. 354—196 **4 Claims**



1. In a photographic or cinematographic camera, in particular with a pancratic (zoom) objective lens and a comparator for comparison of the desired setting e.g. of the near point (punctum proximum) and of the far point (punctum remotum) of a camera space and of the actual setting e.g. of the depth of field, the desired setting being adjusted by means of presetters, the actual setting resulting from the actual setpoints of the objective lens, such as distance, diaphragm and under circumstances focal length, whereby upon differences between the desired setting and the actual setting, a signal can be released, which signal can be fed to an indicator device, and respectively, or to a control device, the improvement comprising

a comparator operatively connected to the objective lens so as to receive a first input representative of an actual value of a parameter of the actual setting of the objective lens,

a memory means including several memory sections each connected to said comparator,

selection means connected to said memory means for transfering inputs representative of values of the actual settings of the objective lens and of the diaphragm to each of said memory sections,

said several memory sections having tabular-like fixed storage of all setpoints which are necessary for a plurality of settings and/or limit values of objective lens settings including corresponding fixed stored precalculated values of said parameter in said several memory sections, the several memory sections each being associated with different ranges of desired values of the depth of field, said memory means for being available for sending signals from each of said memory sections respectively to said comparator, said signals being representative of the stored precalculated values of said parameter, corresponding to said different ranges, for the actual setting of the objective lens and of the diaphragm,

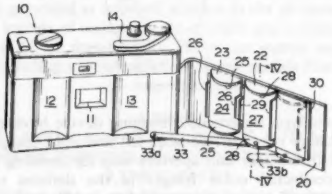
said comparator constitutes means for comparing said signals with said first input and for providing outputs respectively representing the comparisons,

means comprising presetters representing desired values of the depth of field and for operatively selecting a desired depth of field value and for operatively selecting said signals of a corresponding of said memory sections and said outputs of said comparator representing the comparison of the latter mentioned said signals with said actual value of said parameter for providing an evaluation signal for a necessary readjustment of said parameter and said objective lens when said latter mentioned said signals and said first input are not equivalent.

4,290,680
PHOTOGRAPHIC CAMERA

Katsuji Muramatsu, and Yoshihiro Fujita, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 8, 1980, Ser. No. 138,333
Claims priority, application Japan, Apr. 13, 1979, 54-49276[U]
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—203 **5 Claims**



1. A photographic camera to be loaded with a film cartridge comprising a first container for accommodating unexposed roll film and a second container for taking up exposed roll film, the first and second containers being separably connected with each other, said photographic camera comprising,

an aperture for exposure,

a film cavity for receiving the first container formed on one side of the aperture,

a film take-up cavity for receiving the second container formed on the other side of the aperture,

a back lid which is hinged on one side of the camera body and is opened and closed to open and close the film cavity and the film take-up cavity,

a movable holding member for holding one of the first and second containers,

a stationary holding member for holding the other of the first and second containers, and

means for moving the movable holding member between a first position and a second position in response to opening and closing the back lid,

said stationary holding member being fixedly mounted on the inner surface of said back lid at a position confronting one of said cavities in which said other of the first and second containers held thereby is to be received when the back lid is closed,

said movable holding member being positioned in the first position when the back lid is opened, and being positioned in the second position when the back lid is closed,

in the first position, the movable holding member being positioned near the stationary holding member, thereby permitting the first and second containers to be respectively held in their unseparated state by the corresponding holding members, and in the second position, the movable holding member being positioned away from the stationary holding member, whereby the first and second con-

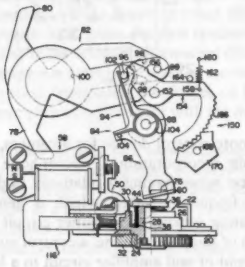
tainers are separated from each other, and confronting the other of said cavities when the back lid is closed.

4,290,681

PROGRAMMED SHUTTER DEVICE

Yoshihisa Maitani, and Katsuhiko Tsunefuji, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,502
Claims priority, application Japan, Dec. 27, 1978, 53-163287
Int. Cl.³ G03B 9/24
U.S. Cl. 354—230 **60 Claims**



1. A programmed shutter device comprising:

a charge mechanism to be charged with a driving force for rotation in response to a film winding operation;

a shutter driving mechanism connected to the charge mechanism to be rotated by the driving force for rotation which is charged in the charge mechanism;

a start position regulating member movable between a first position where the regulating member comes in contact with the shutter driving mechanism to stop the rotation of the shutter driving mechanism and a second position where the regulating member is released from the contact with the shutter driving mechanism to allow the rotation of the shutter driving mechanism;

a release controll means holding the start position regulating member in the first position and releasing the hold of the start position regulating member to shift the start position regulating member to the second position;

a shutter sector means to define the size of an exposure hole movable between a third position to close the exposure hole and fourth position to define the exposure hole;

a connecting mechanism having an elastic member, the connecting mechanism connected to the shutter driving mechanism to be forward and backward reciprocated by the rotation of the shutter driving mechanism, and connected to the shutter sector means to move the shutter sector means from the third position to the fourth position by the elastic member during the forward motion and from the fourth position to the third position by the rotation of the shutter driving mechanism during the backward motion;

a shutter speed determining member movable between a fifth position where the shutter speed determining member is brought in contact with the shutter driving mechanism to stop the rotation of the shutter driving mechanism when the connecting mechanism is completed the forward motion and a sixth position where the shutter speed determining member is released from the contact with the shutter driving mechanism to allow the rotation of the shutter driving mechanism;

a shutter speed control means holding the shutter speed determining member in the fifth position for a fixed time in accordance with the light reflected from a foreground subject and releasing the hold of the shutter speed determiming member to shift the shutter speed determining member to the sixth position;

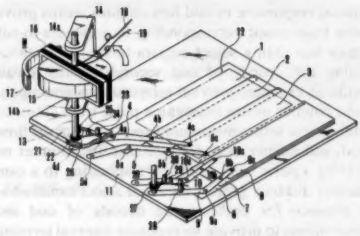
a speed control mechanism controlling speed of the forward motion of the connecting mechanism to control the speed of the movement of the shutter sector means from the third position to the fourth position.

4,290,682

ELECTROMAGNETICALLY OPERATED SHUTTER

Syuichiro Saito, Kawasaki; Takashi Uchiyama, Yokohama, and Syozo Yoshida, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1980, Ser. No. 162,323
Claims priority, application Japan, Jun. 26, 1979, 54-87362[U]
Int. Cl.³ G03B 9/08
U.S. Cl. 354—234 **4 Claims**



1. An electromagnetically operated type slit exposure shutter comprising:

(a) electromagnetic drive sources each having a permanent magnet and a movable magnetic coil for receiving current to exert a rotative force;

(b) shutter blades arranged to open and close an exposure aperture;

(c) shutter blade actuating means for transmitting the rotative force of said electromagnetic drive sources to said shutter blades so as to make said shutter blades run down or up to effect an exposure and a resetting; and

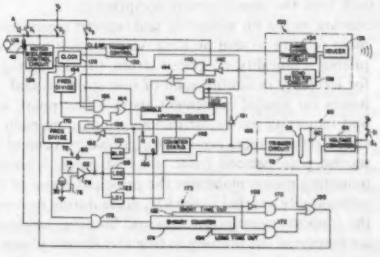
(d) spring means for engaging said shutter blade actuating means, said spring means being arranged for imparting to said actuating means a driving force aiding the running of said shutter blades when said shutter blades start to run, and for imparting a braking force to said actuating means when said shutter blades near the end of movement thereof, while being energized by said actuating means.

4,290,683

SONAR RESPONSIVE SHUTTER BLADE TIME OUT CONTROL CIRCUIT

Judy Bagdis, Bradford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 22, 1980, Ser. No. 189,849
Int. Cl.³ G03B 3/00, 7/097
U.S. Cl. 354—234 **5 Claims**



1. An exposure control circuit for controlling the maximum

time out period for an exposure interval in a photographic camera apparatus of the type including means for defining a film plane, means for transmitting light from a scene along an optical path to expose photosensitive film located in the film plane, and an exposure control system for allowing the passage of scene light along the optical path to the film plane to define an exposure interval, said circuit comprising:

clock means for providing a train of clock pulses;

first counter means for counting said pulse train and providing a total pulse train count corresponding to the camera-to-subject distance range;

second counter means for counting said pulse train and providing a pulse train count which commences generally in synchronism with the initiation of the exposure interval; and

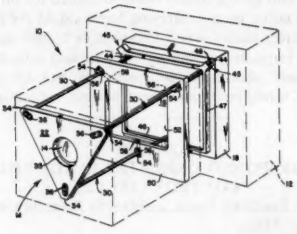
logic means responsive to said first counter means providing a pulse train count corresponding to a camera-to-subject distance less than a select camera-to-subject distance for enabling the decode of said second counter means to provide an exposure interval termination signal upon said second counter means reaching a pulse train count corresponding to a select maximum exposure interval time out period, and further responsive to said first counter means providing a pulse train count corresponding to a camera-to-subject distance greater than said select camera-to-subject distance for enabling the decode of said second counter means to provide an exposure interval termination signal upon said second counter means reaching a pulse train count corresponding to another maximum exposure interval time out period greater than said select maximum exposure interval time out period.

4,290,684

IMAGE STABILIZING APPARATUS

Stephen P. Hines, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1980, Ser. No. 114,931
Int. Cl.[3] G03B *17/00;* **G02B** *23/00*
U.S. Cl. 354—286 **11 Claims**



6. In a camera of the type which includes a housing, a lens for focusing scene light at a film plane, and means for supporting such lens, the improvement comprising:

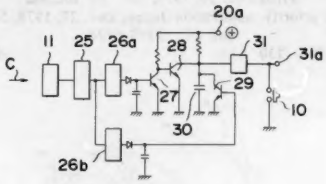
mounting means for mounting said support means for movement relative to said housing, said mounting means comprising a plurality of spaced struts, first mounting means for movably mounting each of said struts to said support means for gimbal movement about a first point; and second mounting means for movably mounting each of said struts to the camera housing for gimbal movement about a second point spaced from said first point, whereby said mounting means maintains the principal plane of the lens substantially parallel to the film plane during movement of the support means relative to said housing, random angular motion of the housing in first and second planes which are perpendicular to each other and to said film plane thereby being substantially decoupled from the lens.

4,290,685

REMOTE CONTROL DEVICE FOR CAMERA

Itsuki Ban, 829, Higashi-Oizumi-machi, Nerima-ku, Tokyo, Japan

Filed Feb. 22, 1980, Ser. No. 123,650
Int. Cl.[3] G03B *17/38, 9/62*
U.S. Cl. 354—266 **4 Claims**



1. A remote control device for a camera, which comprises:

a housing incorporating a microphone for receiving an acoustic wave having a relatively high frequency in an audio frequency range, which is generated by a tone generating source, an amplifier circuit for amplifying an output of said microphone, a control circuit which applies an output of said amplifier circuit to a high-pass filter and a low-pass filter, and when said high-pass filter provides no output or said low-pass filter provides an output, stops the charging or discharging of a capacitor, and when only said high-pass filter provides an output, allows the charging or discharging of said capacitor, and a circuit for operating a shutter of said camera with the aid of an electrical signal which is provided when a voltage across said capacitor reaches a predetermined value, and an electric source for energizing said amplifier circuit; and

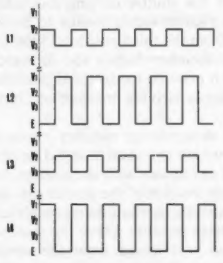
mounting means for fixedly securing said housing to said camera.

4,290,686

LIQUID CRYSTAL DISPLAY DEVICE FOR CAMERA

Ryoichi Suzuki, Kawasaki; Hiroyasu Murakami, Tokyo; Masaharu Kawamura, Kawasaki; Shinji Sakai, Tokyo; Takashi Uchiyama, and Kikuo Momiyama, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,172
Claims priority, application Japan, May 6, 1979, 54-70722
Int. Cl.[3] G09F *9/35;* **G03B** *17/20*
U.S. Cl. 354—289 **8 Claims**



1. A liquid crystal display device for a camera comprising:

(a) a crystal cell, said cell including a first and a transparent second basic plate, on each of which plate a plural number of transparent electrodes are provided so as to form in rows a plural number of electrode pairs to be lit on both sides of the liquid crystal matter;

(b) pulse generating means, said means generating a first

alternating voltage with amplitude **V1**, a first reversed alternating voltage in the reversed phase to that of the first alternating voltage, a second alternating voltage with amplitude **V3** in the same phase as that of the first alternating voltage, and a second reversed alternating voltage in the reversed phase to that of the second alternating voltage, whereby, the first alternating voltage **V1** is larger than the effective voltage value for lighting the crystal cell, while **V3** as well as (**V1**–2**V3**) are smaller than the effective voltage value;

(c) gate means, said means applying the first alternating voltage wave to the transparent electrodes out of those provided on the first transparent basic plate, the second reversed alternating voltage wave to other electrode on the first transparent basic plate, the first reversed alternating voltage wave to the selected transparent electrodes on the second transparent basic plate and the second alternating voltage to other transparent electrodes on the second transparent basic plate in accordance with the input signal; and

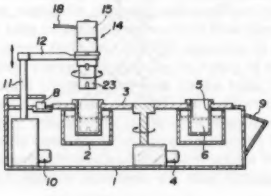
(d) input change over means, said means changing over a plural number of input signal groups at every determined time so as to selectively delivering the input signal group to the gate means in a time dividing way in such a manner that a plural number of the electrode pairs out of those in rows in the liquid crystal cell can be lit visually at the same time.

4,290,687

APPARATUS FOR DEVELOPING PHOTOGRAPHED FILM

Hidehiko Takahashi, 15-4, Soshigaya 4-chome, Setagaya-ku, Tokyo, Japan

Filed Mar. 25, 1980, Ser. No. 133,684
Claims priority, application Japan, Apr. 3, 1979, 54/43133[U]
Int. Cl.³ G03D *3/00*
U.S. Cl. 354—320 **4 Claims**



1. An apparatus for developing a photographed film roll by rotating the roll in a liquid developer, said apparatus comprising:

a case body;

a liquid chamber mounted on said case body;

a turn table rotatably mounted on said case body above said liquid chamber;

processing liquid cup-shaped containers detachably mounted on said turn table and downwardly projecting into said liquid chamber;

a cassette or magazine for housing a photographed film roll having a liquid permeable structure;

means for descending and ascending said cassette or magazine into and out of said containers, said means comprising:

a vertical shaft movable in the vertical direction and extending through said case body, and a horizontal arm extending above said turn table and connected to said vertical shaft;

means for rotating a photographed film roll in one and then the other direction, said means comprising:

a housing adapted to contain a motor,

a motor positioned in said housing and having an output shaft,

a rotary member connected to said output shaft and outwardly projected through said housing, and

a cylindrical holder detachably holding said housing, said holder having a peripheral wall including a flange portion detachably holding said cylindrical holder on said horizontal arm, and a hollow space surrounded by said wall and snugly containing said cassette or magazine; and

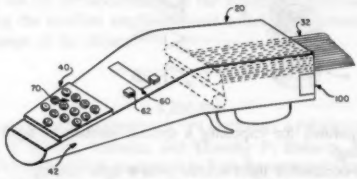
a rotary spool projecting into said cassette or magazine and rotatably connected thereto, said spool having one end connected to said rotary member and another end connected to a photographed film roll whereby when said motor imparts a rotational movement to said rotary member through said output shaft said spool imparts a corresponding rotational movement to a film roll.

4,290,688

APPARATUS FOR COLLECTING MARKET SURVEY DATA FROM UNIVERSAL PRODUCT TYPE CODED ITEMS

James Call, 8 Soundview Dr., Larchmont, N.Y. 10538

Filed Dec. 19, 1978, Ser. No. 970,986
Int. Cl.³ G03B *17/24, 27/00*
U.S. Cl. 355—1 **11 Claims**



1. A market survey data collection lenseless data recorder for universal product type code encoded market data, said data recorder comprising a housing, said housing having a first exposure aperture therein for admitting a source of light therethrough, a photographic recording medium disposed in said housing adjacent said first exposure aperture, means for controllably advancing said photographic recording medium past said first exposure apert for optically aligning a different predetermined portion of said photographic recording medium with said first exposure aperture each time said medium is advanced, said first exposure aperture being optically alignable with a universal product type code on a market item for which said survey data is to be collected, means for enabling reflective photographic recording of said universal product type code data on said medium for said market item in response to the reflection of the image of said universal product type code on to said medium through said first exposure aperture when exposed to said light source, and means disposed in said housing for enabling insertion and photographic recording of ancillary market survey data on said photographic recording medium corresponding to said market item adjacent said photographically recorded universal product type code, said ancillary data insertion and recording means comprising means for enabling direct photographic recording of said inserted ancillary market survey data in response to direct provision of an image corresponding to said inserted ancillary data on to said medium when exposed to said light source, said ancillary data recording means comprising a keyboard means for selectively inserting said corresponding ancillary data, said keyboard means comprising a plurality of keys each capable of providing an unique photographically recordable code designation image to said medium for selectively inserting said ancillary data to be recorded thereon, said ancillary data recording enabling means enabling said direct photographic recording of said selectively inserted code designation images on to said medium when exposed to said light source, said keys each comprising a second exposure aperture associated therewith for defining

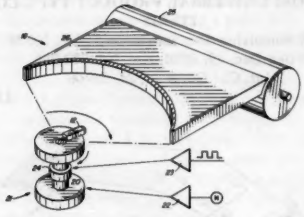
said unique ancillary data code image for each of said keys when said key is enabled for selectively inserting said unique code designation image on to said medium, said ancillary data photographic recording enabling means further comprising a first bundle of fiber optics optically alignable between said ancillary data code image producing keys and said photographic recording medium and selectively exposable to said light source through each of said key second exposure apertures for directly photographically recording said selectively inserted corresponding ancillary data when said key is enabled.

4,290,689

MOVING EXPOSURE SYSTEM

Donald J. Kleinschnitz, Jr., 5240 Sutton Ave., Melbourne, Fla. 32901

Filed Aug. 11, 1980, Ser. No. 177,222
Int. Cl.³ G03B *27/00*; B41B *13/00*
U.S. Cl. 355—1 **18 Claims**



1. Apparatus for exposing a special surface to light rays comprising:

a semi-conductor light source with a light output;

means coupled to said light source for modulating said light source;

means for enabling scanning by the light output; and

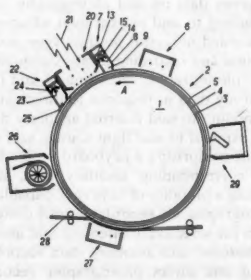
means optically coupled to the light output for optically modifying said light output whereby any optical aberration in the light output due to the scanning is corrected.

4,290,690

DEVICE FOR CONTROLLING POTENTIAL OF LATENT IMAGE FOR USE IN ELECTROPHOTOGRAPHIC APPARATUS

Nobutaka Noda, Kawasaki; Kazuo Hamamura, Yokohama, and Yoichi Morita, Ageo, all of Japan, assignors to Kabushiki-Kaisha K I P, Tokyo, Japan

Division of Ser. No. 859,859, Dec. 12, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,269
Claims priority, application Japan, Dec. 27, 1976, 51-156250
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **11 Claims**



1. In an apparatus for electrophotography of the kind comprising: a photosensitive element on a movable drum and including an electrode layer, a photoconductive layer and a transparent insulating layer, these layers being integrally provided in the order described; a first corona discharging means for applying first charges of one polarity to said insulating layer of said photosensitive element under the condition that an interface between said photoconductive and insulating layers is substantially filled with trapped charge carriers which have flowed through said photoconductive layer; a second corona discharging means for applying second charges of a polarity opposite to said one polarity and simultaneously projecting a light image to said element; and means for projecting a substantially uniform light to said element; the recited means thereby completing formation of an electrostatic latent image on said insulating layer; and means for developing said latent image by use of a developing agent; the improvement comprising:

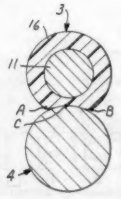
further uniform light projecting means in close contact with said second corona discharging means and operative just before said corona discharging means to release some of said charge carriers from the trapped condition, such that the released charge carriers can flow to said electrode layer during the application of said second charge to said insulating layer to control the potential of said latent image.

4,290,691

METHOD AND APPARATUS USING LOW GLOSS PRESSURE FUSING ROLL

Norman L. Giorgini, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 15, 1979, Ser. No. 84,987
Int. Cl.³ G03G *15/20, 13/20*
U.S. Cl. 355—3 FU **8 Claims**



5. In a photocopy machine, an assembly for fixing pressure-fixable imaging powder to a receptor at ambient temperature so as to produce permanent low gloss image and non-image areas on said receptor, said assembly comprising:

means for providing an image of electrostatically held, unfixed, pressure-fixable imaging powder on a surface of said receptor;

first and second pressure members that have skewed axes with respect to each other, wherein said pressure members contact each other along a narrow nip therebetween, the first member having a compliant, textured surface that engages the imaged surface of said receptor, the second member having a non-compliant, textured surface that engages the non-imaged surface of said receptor, wherein said textured surface of said second member restricts slippage of said receptor with respect to said second member, and wherein said textured surface of said second member has sharp peaks thereon; and

means for rotating said pressure members in opposite directions while providing sufficient pressure at their nip to fix said powder to said receptor when said receptor passes between said members.

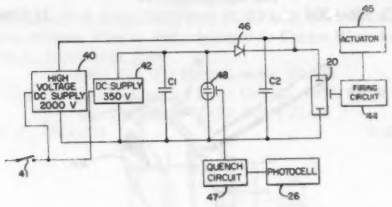
4,290,692
PHOTOGRAPHIC STROBE APPARATUS

Thomas A. Svatek, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 914,219, Jun. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,685, Sep. 19, 1977, abandoned. This application Jul. 6, 1979, Ser. No. 55,326

Int. Cl.³ G03B *27/72*; H05B *37/02*

U.S. Cl. 355—69 **3 Claims**



1. A photographic flash circuit having an electronic strobe tube operable at high voltage to produce a relatively large amount of illumination of high intensity, said circuit having a storage capacitor of relatively small capacitance, means for charging said capacitor to a relatively high voltage, means for coupling said storage capacitor to said strobe tube, and means for triggering said strobe tube into conductance to thereby produce a short, high intensity pulse of illumination responsive to discharge of said storage capacitor through said strobe tube, the improvement comprising:

means for automatically producing a relatively small amount of additional illumination of relatively constant low intensity from said strobe tube following said high intensity pulse, and means operable for terminating said low intensity illumination to thereby provide precise control over the total illumination produced, said producing means including an auxiliary capacitor of comparatively large capacitance, means for coupling said auxiliary capacitor to said strobe tube so as to permit current flow thereto while blocking current from said storage capacitor to said auxiliary capacitor whereby, following charging of said capacitors and upon triggering of said strobe tube, a burst of high intensity illumination of relatively short duration is automatically followed by additional illumination at an approximately constant level of comparatively low intensity for a comparatively long duration whose termination can be controlled to determine the total illumination.

4,290,693
ARRANGEMENT FOR MEASURING THE RANGE OR SPEED OF AN OBJECT

Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 15, 1979, Ser. No. 20,813

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813913

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.³ G01C *3/08*; G01P *3/68*; G01J *1/36*; G03B *13/18*

U.S. Cl. 356—1 **24 Claims**

1. In an arrangement for measuring the range of an object, wherein two optical devices are provided which are offset relative to one another transverse to the direction of the object and which supply two images of such object, with a device being provided which analyzes the images, in the form of electrical signals, and by a comparison of the signals, forms a measured value which indicates the range, combination of the analyzing device containing two CTD image sensors which are individually assigned to the auxiliary images, and whose aligned image points are arranged parallel to one another and in the direction of mutual displacement of the auxiliary images, an evaluating circuit, having one input to which the output of one CTD image sensor is operatively connected, and a second input to which the output of the other image sensor is connected over a delay element which can be adjusted, in a stepped manner, in a setting sequence, for forming from the difference between a sequence of read-out signals from the two

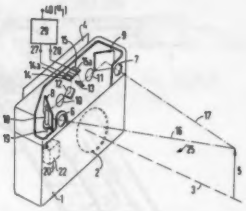


image sensors assigned to the setting sequence, a sequence of read-out signals integrated over said image points, and means in said evaluating circuit for forming a signal in correspondence to such read-out signals, which is characteristic of the delay set on the occurrence of the integrated read-out signal having the smallest amplitude, and which is representative of the range of the object.

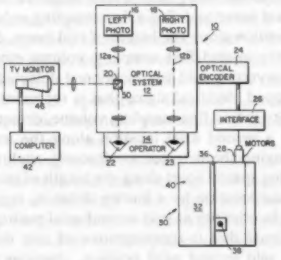
4,290,694
PHOTOGRAMMETRIC PLOTTING APPARATUS

Hans J. Wehrli, Valhalla, and Timothy P. Roberts, Mohegan Lake, both of N.Y., assignors to Kern Instruments, Inc., Brewster, N.Y.

Filed Mar. 7, 1980, Ser. No. 127,947

Int. Cl.³ G01C *11/12*

U.S. Cl. 356—2 **13 Claims**



1. A photogrammetric plotting apparatus comprising:

(a) an optical system means for operator viewing of an image of a first stereomodel derived from a pair of stereoscopically related photograms.

(b) operator controlled means for effecting stereomodel exploring motions relative to the photograms.

(c) a tracing or display device;

(d) means for converting the exploring motions into plotting motions for the tracing or display device;

(e) means for scanning image data of a second model to produce an image of the second model;

(f) means for conveying the image of the second model to the optical system means;

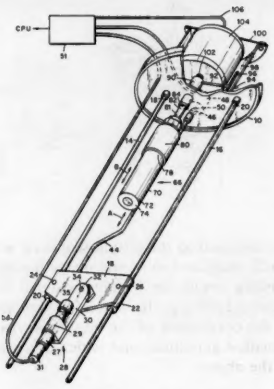
wherein the optical system means includes a means for superimposing the image of the second model on the image of the first stereomodel for simultaneous viewing by the operator.

4,290,695

METHOD AND APPARATUS FOR MEASUREMENT OF TRANSMITTANCE AND SCATTER OF LIGHT IN WATER

Harold W. Schmitt, Knoxville, Tenn., assignor to Environmental Systems Corporation, Knoxville, Tenn.

Filed Sep. 28, 1979, Ser. No. 80,056
Int. Cl.[3] G01N *21/01*
U.S. Cl. 356—73 4 Claims



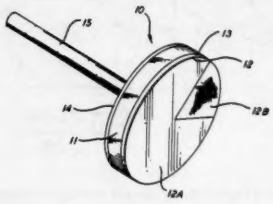
1. A method for measuring light transmittance and scatter in a liquid medium comprising the steps of directing a substantially collimated beam of relatively broad spectrum light into said medium from a source of said light, detecting the light intensity at a first axial location along the length of said beam, converting said detected light intensity to a first electrical signal, changing the relative angular positions of said beam and said detector to a first angular position wherein the axis of said beam is oriented at an angle with respect to said detector such that the projected solid acceptance angle of said detector intersects said beam to define a first sampling volume at a first sampling position along the length of said beam, detecting the light intensity in said first sampling volume employing said detector, converting said last mentioned detected light intensity to a second electrical signal that is representative of said light intensity in said first sampling volume, detecting the light intensity at a second axial location along the length of said beam employing the detector as aforesaid, such second axial location being spaced apart along the length of said beam from said first axial location by a known distance, converting said detected light intensity at said second axial position to a third electrical signal that is representative of said detected light intensity at said second axial position, changing the relative angular positions of said beam and said detector to a second angular position wherein the axis of said beam is oriented at an angle with respect to said detector such that the projected solid angle of acceptance of said detector intersects said beam to define a second sampling volume at a second position along the length of said beam, said first and second angular positions being angularly substantially equal, said second position of said second sampling volume being spaced apart along the length of said beam by a known distance, detecting the light intensity in said second sampling volume employing said detector, converting said detected light intensity to a fourth electrical signal that is representative of said light intensity in said second sampling volume, comparing said first and third electrical signals and converting their ratio to an electrical signal that is representative of the axial light transmittance of said medium, and comparing said second and fourth electrical signals and converting their ratio into an electrical signal that is representative of the light scatter in said medium.

4,290,696

SPECTROPHOTOMETRIC SYSTEM

Henry M. Mould, Penn, and George E. Hirst, High Wycombe, both of England, assignors to Perkin-Elmer Limited, Beaconsfield, England

Division of Ser. No. 819,837, Jul. 28, 1977, which is a division of Ser. No. 698,042, Jun. 21, 1976, abandoned. This application Sep. 24, 1979, Ser. No. 77,977
Claims priority, application United Kingdom, Oct. 24, 1975, 43723/74
Int. Cl.[3] G01J *3/02*
U.S. Cl. 356—300 11 Claims



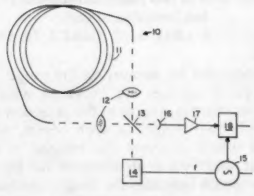
1. A spectrophotometric system comprising:
photometric optics including means for generating photometric radiation;
radiation receiving means is spaced relation with said radiation generating means;
an optical device, interposed between said radiation generating means and said radiation receiving means, for providing an optical path from said radiation generating means to said radiation receiving means, said optical device comprising;
a substantially opaque layer, said layer defining at least first and second coplanar face regions, said face regions having distinguishable optical functions being arranged in a predetermined geometrical relationship;
means for supporting said layer, said means being a rigid substrate;
a film bonding agent, between said layer and said rigid substrate means, for permanently maintaining said predetermined geometrical relationship, and
means for mounting said optical device for movement between different operative positions to selectively interpose said face regions between said radiation generating means and said radiation receiving means.

4,290,697

METHOD TO ELIMINATE FIBER INTERFEROMETER REFLECTIONS

Matthew N. McLandrich, Carlsbad, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1979, Ser. No. 60,943
Int. Cl.[3] G01C *19/64*
U.S. Cl. 356—350 5 Claims



1. In a fiber interferometer gyro having a looped single-mode fiber coupled to bidirectionally transmit beams of light

from a laser to a detector, an improvement therfor is provided comprising:

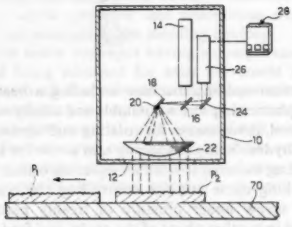
means disposed external the light beam paths and coupled to the laser and the detector for amplitude modulating the laser output and synchronously detecting the detector output with a reference signal of the same frequency as the amplitude modulating signal $\pi/2$ phase shifted with respect to the amplitude modulating signal to eliminate gyro reflections attributed to fiber ends and coupling lenses.

4,290,698

APPARATUS FOR TESTING SURFACE ROUGHNESS

Emilio Milana, Rivalta, Italy, assignor to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Aug. 23, 1979, Ser. No. 69,135
Claims priority, application Italy, Oct. 24, 1978, 69438 A/78
Int. Cl.³ G01B *11/30*; G01N *21/55*
U.S. Cl. 356—371 **6 Claims**



1. Apparatus for testing the surface roughness of a workpiece which has been subjected to a mechanical working operation, comprising in combination,

a support for the workpiece to be tested,

a laser radiation source,

a first optical system positioned in the path of radiation from said radiation source and operating to direct the beam of radiation emitted by said source onto the surface of a workpiece to be tested mounted on said support,

means for relatively displacing said support and said beam of radiation whereby to scan said beam of radiation over the region of interest of said surface of said workpiece under test,

a photomultiplier,

a second optical system positioned in the path of the specular component of radiation reflected from each point of said scanned region of said surface of said workpiece under test and operating to direct said specular component of the reflected radiation to said photomultiplier whereby to obtain at the output of said photomultiplier an electrical signal indicative of the intensity of said component,

an electronic processor circuit connected to the output from said photomultiplier, said processor circuit operating to derive a numerical value corresponding to the mean level of said output signal and to provide a numerical indication of at least one of the ratio and the difference between said numerical value and a reference numerical value,

said first and second optical systems together comprise:

a semi-transparent mirror positioned to deflect by 90° radiation incident thereon from said laser radiation source,

a cylindrical lens,

a first reflector positioned in the path of radiation reflected from said semi-transparent mirror so as to deflect it to said cylindrical lens, said cylindrical lens having its focal line passing through the point on said first reflector at which incident radiation from said semi-transparent mirror impinges and having its optical axis normal to the surface of said workpiece to be tested,

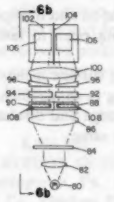
a second reflector positioned to deflect towards said photomultiplier the specular component of reflected radiation from each point of the scanned zone of the said surface, which arrives at said second reflector after having passed through said cylindrical lens, and said means for relatively displacing said support and said beam of radiation comprise means for causing said first reflector to oscillate about an axis parallel to the surface of said workpiece to be tested and passing through the focus of said cylindrical lens.

4,290,699

COLOR SYNTHESIZING

Elbert M. Idelson, 1603 Commonwealth Ave., West Newton, Mass. 02165

Filed Apr. 4, 1979, Ser. No. 26,928
Int. Cl.³ G01J *3/46*
U.S. Cl. 356—420 **12 Claims**



1. A plural channel color synthesizing instrument comprising

a light source,

baffle structure for directing light from said source along a plurality of separate optical paths so that there is a beam of light from said source in each optical path,

light receiving means asociated with each optical path for receiving light from said source in the beam transmitted along that optical path,

dispersion means disposed in said optical paths between said light source and said light receiving means for dispersing light in each said beam to form a spectrum of the source,

a mask holder disposed in each said path between said light source and said light receiving means for receiving a color synthesizing mask, each said mask holder defining a aperture and being arranged to receive a planar black-white type mask structure for insertion into and removal from the mask holder aperture in location coordinated with wavelength and amplitude parameters of the spectrum of the light source in that beam, and

color synthesizing mask structure for insertion into and removal for each said mask holder, each said mask structure being of the black-white type and having a light blocking portion effective to modify the spectrum when the mask structure is interposed in the corresponding beam of light,

each said light receiving means including means for recombining the light energy in unblocked portions of said spectrum for simultaneously synthesizing a different color at each said light receiving means.

4,290,700

MEASURING APPARATUS FOR SHOT DISPENSERS

George S. Hudimac, Jr., Allentown, Pa., assignor to Mechanical Service Company, Allentown, Pa.

Filed Nov. 8, 1979, Ser. No. 92,332
Int. Cl.³ B28C *7/04*
U.S. Cl. 366—76 **5 Claims**

1. In apparatus for delivering accurate amounts of a mixture of at least two liquid ingredients, including ingredient supply means and mixer means to receive, mix and deliver said mixture, measuring means to be disposed between said supply and mixer means to determine the quantity of each ingredient to be

delivered to the mixer means, the measuring means comprising:

a hollow housing;

a plurality of pairs of ports in said housing, each pair comprising an inlet port and an outlet port and each port having a mouth;

working surface means extending around and between the inlet port and outlet port of each said pair, the mouth of each port being open to the working surface means;

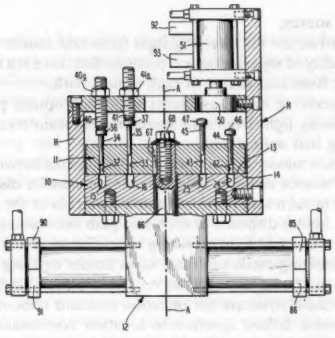
transporter means movably mounted in said housing for movement as between a charge position and a discharge position;

a plurality of cavities formed in said transporter means, each cavity having a mouth;

means to move said transporter means as between said positions;

working surface means on said transporter means, the mouth of each cavity being open to last said working surface means;

the first said working surface means and last said working surface means being in engagement when the transporter means is in said charge and discharge positions and as it moves between the same;



said cavities respectively being in registry with said inlet ports when said transporter means is in the charge position and being respectively in registry with said outlet ports when the transporter means is in the discharge position and said inlet ports and said cavities being closed off respectively by the engagement of said working surface means when the transporter means moves as between said charge and discharge positions;

inlet passage means in said housing respectively independently connecting each inlet port to the exterior of said housing for respectively independently delivering ingredients from the exterior of the housing to the inlet ports and thence into the respective cavities;

outlet passage means in said housing respectively independently connecting each outlet port to the exterior of said housing for respectively independently delivering ingredients from cavities to the exterior of the housing; and

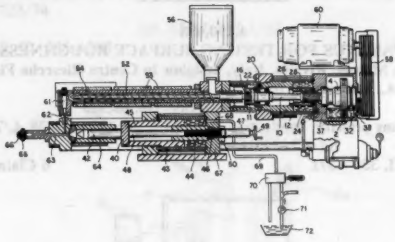
control means operative when the transporter means is in the charge position to control the amount of ingredient material to be received by a cavity and operative when the transporter means is in the discharge position to cause ingredient material in each cavity to flow out of the cavity and into said outlet passage means.

4,290,701

INJECTION-MOLDING MACHINE WITH RECIPROCATING PLASTICIZING SCREW

Robert D. Schad, Bolton, Canada, assignor to Husky Injection Molding Systems Inc., Bolton, Canada

Filed Jul. 6, 1979, Ser. No. 55,371
Int. Cl.³ B28C 7/16
U.S. Cl. 366—77 **13 Claims**



1. In an injection-molding machine including a heated extruder barrel, a plasticizing screw rotatable and axially reciprocable in said barrel, drive means for rotating said screw, operating means for hydraulically advancing said screw for feeding plasticized molding material toward an injection orifice in one phase of a working cycle and for controlling the rearward motion of said screw under pressure of freshly plasticized molding material in another phase of the cycle, and feed means for supplying said molding material to said barrel,

the improvement wherein said drive means comprises a tubular input shaft with internal splines, a quill having a splined rear extremity slidably coupled with said input shaft by way of said internal splines, and a releasable coupling between said screw and a forward extremity of said quill;

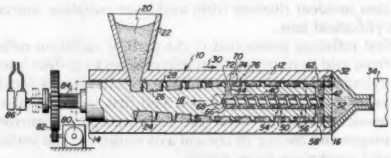
said operating means comprising an annular extruder cylinder coaxially surrounding said quill, a tubular extruder piston partly received in said extruder cylinder and provided with a projecting front end, bearing means operatively linking said front end with said quill for transmitting axial forces therebetween, a shooting pot alongside said barrel provided with a discharge channel terminating at said injection orifice and communicating with an outlet port of said barrel ahead of said screw, a plunger in said shooting pot controlled by hydraulic actuating means, and adjustable backstop means limiting the stroke of said plunger.

4,290,702

PLASTICATING APPARATUS FOR MOLDING DEVICES

Reuben Klein, Edison, and Imrich Klein, Highland Park, both of N.J., assignors to Scientific Process & Research, Inc., Highland Park, N.J.

Filed Dec. 17, 1979, Ser. No. 104,094
Int. Cl.³ B29B 1/06
U.S. Cl. 366—77 **9 Claims**



1. Apparatus for plasticating material to be delivered intermittently to a molding device, said apparatus operating contin-

uously during periods of delivery and non-delivery of plasticated material, said apparatus comprising:

a barrel;

a first screw conveyor in the barrel, said first screw conveyor including a flight defining a channel for continuously conveying the material in a downstream direction as the material is melted within the channel, said flight having a leading face facing downstream and a trailing face facing upstream, said channel extending between the leading face and the trailing face;

a backfeed passage within the first screw conveyor, said backfeed passage communicating with the channel at a downstream location and at an upstream location to establish a circuit along which the material will move through the channel and the backfeed passage;

a second screw conveyor located in said backfeed passage and arranged to convey material from the downstream location to the upstream location so as to enable recirculation of material along the circuit through the backfeed passage and the channel during continuous rotation of the first screw conveyor and intermittent delivery of plasticated material to the molding device;

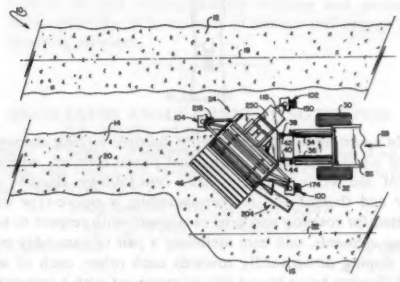
the first screw conveyor having a downstream terminal end and being mounted for axial movement relative to the barrel such that movement in the upstream direction will increase the capacity of the circuit to accommodate added plasticated material to be accumulated within the circuit as the first screw conveyor continues to rotate and generate the added plasticated material during periods of non-delivery of plasticated material to the molding device.

4,290,703

WINDROWING TYPE COMPOSTING APPARATUS

Walter C. Roman, Worthington, Ohio, assignor to Ultimate Resources, Inc., Westerville, Ohio

Filed Jan. 23, 1980, Ser. No. 114,634
Int. Cl.³ B02C *21/02*
U.S. Cl. 366—345 **11 Claims**



1. Windrowing apparatus for laterally transferring an elongate row of biodegradable material, said row being oriented along a given centrally disposed axis and having a given width, comprising:

a windrow conveyor having spaced, parallel mutually interconnected elongate paddles driveably movable and having a downwardly disposed region for confronting said row of material and progressively moving said material to form an adjacent said row thereof;

motor means for driving said paddles;

a rigid frame;

coupling means rearwardly disposed upon said frame for connecting said frame with the forward portion of a drive vehicle, said vehicle serving to push said apparatus in a forward direction having a principal horizontal vector substantially parallel and in alignment with said axis when said conveyor confronts said row;

mounting means for mounting said conveyor at a forwardly disposed portion of said frame such that said paddles within said downwardly disposed region are disposed at an acute angle with respect to said principal vector when said conveyor is urged into said confrontation with said row;

first and second freely rotatable wheel means connected with said frame and each being freely pivotal about vertical axes for supporting said frame for movement, said first and second wheel means being spaced apart having respective positions of attachment with said frame generally rearward of said conveyor and mutually disposed on opposite sides of said coupling means, said first wheel means being disposed at a first said side rearwardly of said conveyor downwardly disposed region, said second wheel means being disposed at a second said side outwardly of said downwardly disposed region; and

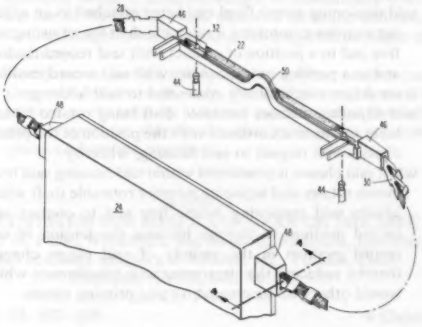
third freely rotatable wheel means freely pivotal about a vertical axis and attached to said frame at said second side in the vicinity of the forward portion of said downwardly disposed region for supporting said frame for movement at a predetermined level.

4,290,704

FLEXIBLE RIBBON GUIDE MEANS

Dan W. Matthias, Downingtown, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 9, 1979, Ser. No. 92,690
Int. Cl.³ B41J *31/12, 35/04*
U.S. Cl. 400—248 **10 Claims**



1. An improved leader means for use in a printing machine of the type utilizing a stationary ribbon supply means and flexible leader means for guiding ribbon to the print location of said machine, said print location being relatively moveable with respect to said supply means comprising:

a central web formed from a flexible material having tabs projecting in alternate fashion from said central web and being bent through an angle with respect to said web such that the distal ends of said tabs overlap with one another thereby forming a channel within which said ribbon may be guided, said leader being bendable in a first direction but not bendable past the flat in an opposite direction.

4,290,705

ELECTROMAGNETIC INTERFERENCE REDUCTION FOR ELECTRONIC LINE PRINTERS

Samuel Goldfarb, Roslyn, and Thomas Reilly, North Lindenhurst, both of N.Y., assignors to Litton Systems, Inc., Melville, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,658
Int. Cl.³ B41J *11/26*
U.S. Cl. 400—618 **4 Claims**

1. An electronic line printer of the electrical discharge type

characterized by reduced electromagnetic interference from such electrical discharge, comprising:

a printer chassis including record medium storage means;

a housing for said printer chassis;

said chassis being positionable within and without said housing;

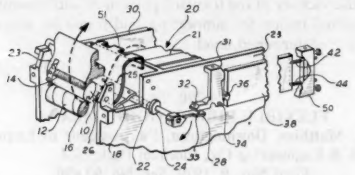
a platen comprising a fixed cylindrically-shaped member mounted on said chassis and adapted to be in contact with the record medium;

electronic printing means for contacting said record medium for printing visible symbols on said record medium; and

record medium tensioning means;

said tensioning means comprising a resilient laminar member disposed proximately to said platen and being provided with a free end adapted to be in contact with said record medium for applying a tension force thereto;

said platen being provided at its surface with a channel;



said record medium being adapted to be in contact with said platen in the vicinity of said channel;

said tensioning means being also provided with a fixed end;

said tensioning means fixed end being attached to an adjusting member comprising a rotatable shaft for adjusting said free end to a position of contact with said record medium and to a position out of contact with said record medium;

lever means mechanically connected to said housing;

said adjusting member rotatable shaft being rotated by said lever means in accordance with the position of the printer chassis with respect to said housing; whereby

when said chassis is positioned within said housing said lever means rotates said adjusting member rotatable shaft which adjusts said tensioning means free end to contact said record medium to thereby increase the tension of said record medium in the vicinity of said platen channel thereby reducing the electromagnetic interference which would otherwise be created by said printing means.

4,290,706

AGITATOR FOR CYLINDRICAL CONTAINES FILLED WITH PAINT OR THE LIKE

Rudolf H. Wandl, Binau, Fed. Rep. of Germany, assignor to Kurt Vogelsang GmbH, Hassmersheim, Fed. Rep. of Germany

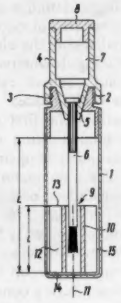
Filed Jan. 30, 1980, Ser. No. 116,965

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903401; Oct. 24, 1979, 2942994

Int. Cl.³ B44D *3/12*

U.S. Cl. 401—4 **8 Claims**

1. Cylindrical container for paint or the like, comprising a hollow container body, a cap, a brush attached to the cap, and an agitator constructed as a tubular hollow member guided in the container in the axial direction of the latter, surrounding said brush attached to the cap, and having radially outwardly projecting ribs, characterized in that the ribs are fashioned in the manner of blades of a fan wheel and are uniformly distributed about the periphery of the hollow member, wherein the outer edges of the ribs are located on an imaginary cylinder, the diameter of which is slightly smaller than the inner diameter of the container body, and also characterized in that the ribs



are twisted helically with respect to the longitudinal axis of the hollow member.

4,290,707

WRITING INSTRUMENT HAVING MULTIPLE WRITING ELEMENTS

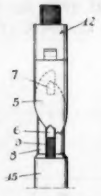
Tatsuo Ariga, 16-19, Haneki 1-Chome, Setagaya-ku, Tokyo, Japan

Filed Mar. 22, 1979, Ser. No. 22,879

Claims priority, application Japan, Mar. 31, 1978, 53/40983[U]

Int. Cl.³ B43K *5/16, 24/02*

U.S. Cl. 401—110 **5 Claims**



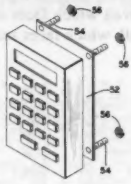
1. In a writing instrument having multiple writing elements, one of which includes a mechanical pencil element, wherein each of said writing elements has a cam follower fixed to the upper end thereof and further including a sleeve-type cam mounted for rotation and axial movement with respect to said writing elements, said cam including a pair of cam edge portions sloping downwardly towards each other, each of said cam followers being biased into engagement with a respective one of said cam edge portions, the improvement comprising:

said sleeve-type cam having a substantially vertically extending edge portion interconnecting the upper ends of said cam edge portions, whereby upon said pencil element being moved to its operative position, the cam follower fixed to the upper end of said other writing element is substantially aligned with the vertically extending edge portion so that upon axially moving the cam, the cam follower aligned with the vertically extending cam edge portion will not be moved; a head member having an axial portion fixed to the upper end of said cam; a clip member having a ring portion located over said axial portion of said head member; an actuator housing element having an open top; said cam and head member being fixed to said housing element with said axial portion extending through said open top; a retainer ring fixed to said axial portion for retaining the ring portion of said clip member in position; and a cap member fixed to said axial portion.

4,290,708
ATTACHABLE MICROPROCESSORS

John T. Siwula, 145 Sanford Dr., Jamestown, N.Y. 14701

Filed Aug. 7, 1978, Ser. No. 931,382
Int. Cl.[3] F16B *1/00*
U.S. Cl. 403—24 5 Claims



1. An attachable microprocessor comprising the combination of:

(a) a microprocessor having a housing including a generally planar surface attachable to a separate object; and

(b) fastening means including a plurality of elongated fastening elements each connected to said microprocessor housing and extending therefrom in a direction generally perpendicular to the plane of said housing surface for connection to said object, each of said elongated fastening elements being of sufficient length and having such a cross sectional shape which enables it to be received in an opening provided in said object for securement to said object when in said opening, and each of said fastening elements being readily removable from said object and said microprocessor housing in a manner which is non-destructive to said fastening elements, object and microprocessor housing;

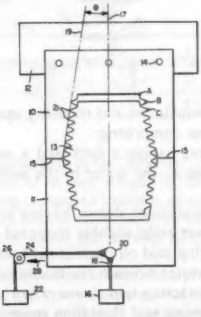
(c) whereby said fastening means attaches said microprocessor to said object in a manner such that said housing surface faces toward said object;

(d) said housing surface is defined by a plate removably secured to said microprocessor housing and provided with a plurality of formations to recieve and engage said fastening elements.

4,290,709
HIGH TAPER ANGLE CONNECTING PIN FOR GRAPHITE ELECTRODE JOINTS

Emanuel J. Seldin, Middleburg Heights, Ohio, and Tu-Lung Weng, San Jose, Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,887
Int. Cl.[3] F16B *7/18;* H05B *7/06*
U.S. Cl. 403—296 8 Claims

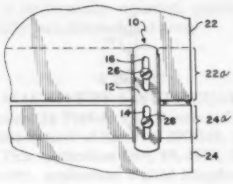


1. A connecting pin for joining two graphite electrode sections, said pin being tapered and threaded on both ends, the angle of said taper from the centerline of said pin being between about 15° and about 35°.

4,290,710
METAL FASTENING PLATE

Arthur Waller, Highland Park, Ill., assignor to Bull Dog Lock Co., Chicago, Ill.

Filed Mar. 10, 1980, Ser. No. 128,733
Int. Cl.[3] F16B *12/00*
U.S. Cl. 403—306 2 Claims



2. A fastening plate for joining two adjacent pieces of furniture together utilizing screws, said plate comprising:

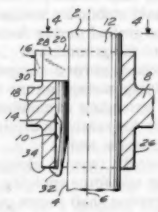
a longitudinal metal strip having at least two completely enclosed longitudinal apertures of uniform width for permitting a continuous selection of screw locations along the entire length of each aperture, said apertures extending sequentially along the length of the strip, each of the apertures being of sufficient length to substantially overlap one of the two adjacent pieces of furniture, and reinforcing flanges extending along the longitudinal edges of said strip,

whereby one screw inserted through an aperture secures one piece of furniture to the strip, the other piece of furniture secured to the strip by a second screw inserted through another aperture, thereby the plate joining two adjacent pieces of furniture together.

4,290,711
KEY SYSTEM FOR SHAFT AND GEAR OR THE LIKE

Ellis H. Paine, Woodstock, and Roger E. Anderson, Brooklyn, both of Conn., assignors to Moldex, Inc., Putnam, Conn.

Filed Jan. 7, 1980, Ser. No. 109,977
Int. Cl.[3] F16D *1/08*
U.S. Cl. 403—358 8 Claims



1. In combination, a shaft portion and a hub mounted thereon, a wedge construction having a body portion with a top surface which is an arcuate segment of a cylinder and a bottom surface which is a flat surface in a plane parallel to the axis of said cylindrical surface, said shaft portion having an outer surface which is an arcuate segment of a cylinder and which compliments the first-named arcuate segment to form a substantially complete cylinder, said shaft portion having a flat surface which is coextensive with the first-named flat surface, said wedge and said hub having interlocking means which present mating surfaces which are positioned radially out-

wardly from said arcuate segments and which interengage so as to prevent said hub from turning around said axis relative to said wedge, and said hub and said shaft portion are held from turning relative to each other around said axis.

4,290,712

PLASTIC POST APPARATUS AND METHODS

Norman J. Hayes, P.O. Box 618, Cody, Wyo. 82414

Filed Apr. 2, 1979, Ser. No. 26,100
Int. Cl.³ E01F *9/01*
U.S. Cl. 404—10 **29 Claims**

1. Post apparatus made of one piece of molded polymeric material and comprising:

a vertically upwardly extending elongated post means portion for supporting apparatus mounted thereon;

a driving head means portion connected to and mounted below the lower end of said post means portion for application of force thereto without application of force to the upper end of said post means portion for forcibly driving the post apparatus into the ground;

stabilizing flange means portions mounted on said driving head means portion below the lower end of said post means portion for stabilizing and supporting the post apparatus in a vertical attitude after being forcibly driven into the ground;

a ground penetrating shaft means portion connected to and mounted below said stabilizing means portion for initial penetration of the ground during forcible driving of the post apparatus into the ground; and

said driving head means portion comprising an upwardly facing force applying surface means radially outwardly spaced from and extending circumferentially about said post means portion for receiving driving force applied to said head means portion, and

a downwardly inwardly tapered elongated core portion extending between said force applying surface means and said ground penetrating shaft means portion.

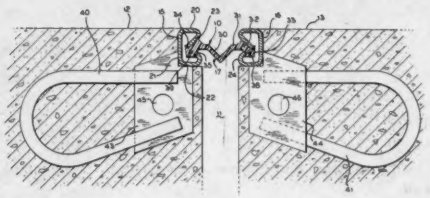
4,290,713

EXPANSION JOINT SEALING STRUCTURES

Delmont D. Brown, North Baltimore, Ohio, and Michael C. Rizza, Walnut Creek, Calif., assignors to The D. S. Brown Company, North Baltimore, Ohio

Filed Sep. 19, 1979, Ser. No. 76,908
Int. Cl.³ E01C *11/02*
U.S. Cl. 404—69 **7 Claims**

1. An expansion joint between adjacent pavement sections with an elastomer seal comprising a first frame of rolled steel mounted on and extending along one side of said joint, an opposing second frame of rolled steel mounted on and extending along the other side of said joint, and an elastomer sealing strip spanning the joint and having its respective longitudinal edges seated in a respective frame, said frames and said elastomer strip being characterized by an elongated strip of steel roll-formed into elongated, integral top, bottom and rear walls and an integral front wall which faces said joint on one frame opposing the front wall, which faces said joint, of said second



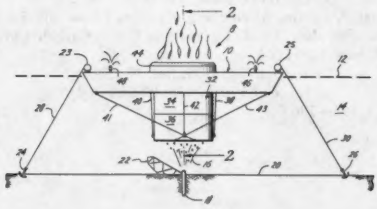
frame, said front wall of each frame comprising a downwardly and rearwardly sloping upper segment integral with said top wall and an upwardly projecting, lower segment integral with said bottom wall, each segment having a longitudinal edge spaced from the longitudinal edge of the other segment to form a longitudinal slot in each front face, and said elastomer sealing strip having respective, longitudinal, edge members seated in the respective longitudinal slots of said frames.

4,290,714

MARINE OIL LEAK CONTAINMENT AND RECOVERY APPARATUS

Booth B. Strange, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Dec. 3, 1979, Ser. No. 99,388
Int. Cl.³ E02B *15/04*
U.S. Cl. 405—60 **16 Claims**



1. An oil leak containment and recovery apparatus for use in water-covered areas comprising:

a floatation means having a deck and a well therethrough open to the water, the water in the well rising to a prescribed level;

a hollow oil containment sleeve, having a wall, open at its upper and lower ends, slidably mounted in said well;

means for lowering said oil containment sleeve through the well into the water beneath the floatation means when in use and for retracting said sleeve when underway;

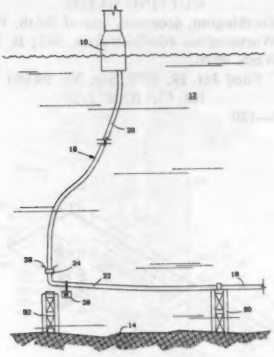
means for anchoring said floatation means over an oil/gas leak so that an upward flow of said oil and gas becomes entrapped at the upper end of said sleeve; and

means for removing the entrapped oil to storage.

4,290,715
PIPELINE RISER FOR FLOATING PLATFORMS

Pierre A. Beynet, Tulsa, Okla., and Emil K. Williams, Gretna, La., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 5, 1979, Ser. No. 45,717
Int. Cl.[3] E02D *21/00*; B23Q *1/08*; F16L *1/00*
U.S. Cl. 405—169 9 Claims



1. An unarticulated riser pipe for connecting a subsea pipeline to a floating structure in a body of water comprising:

(a) a vertical riser pipe section supported at the upper end by said floating structure;

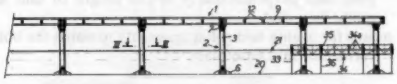
(b) a section for providing flexibility including a horizontal pipe section connected at one end to said subsea pipeline and at the other end rigidly connected to said vertical riser pipe section, said horizontal pipe being supported from the bottom of said body of water only near said one end with the other end above said bottom; and

(c) weight means connected to and supported by the lower end of said vertical riser pipe section so as to apply a downward force to the lower end of said vertical riser pipe section.

4,290,716
PLATFORM RESTING ON THE BOTTOM OF A BODY OF WATER, AND METHOD OF MANUFACTURING THE SAME

Jacques E. Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses sous Marines "C. G. Doris", Paris, France

Filed Apr. 6, 1979, Ser. No. 27,828
Int. Cl.[3] E02B *17/02*
U.S. Cl. 405—203 5 Claims



1. An offshore platform of the "gravity" type being designed for lying by virtue of its own weight on the bottom of a body of water and being composed basically of an underframe structure resting on the bottom of the body of water and supporting a bridge structure above the surface of the body of water, wherein:

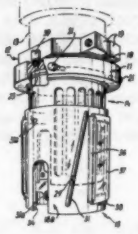
said underframe structure comprises a plurality of longitudinally-spaced and transversely-extending piers, each of the plurality of piers including a pluraity of transversely-spaced upright posts in mutual transverse alignment, a common transverse base resting on the bottom of the body of water and carrying lower ends of the upright posts, and a common cross-beam overtopping upper ends of the upright posts, whereby an assembly of said upright posts, said base, and said cross-beam form together each of the plurality of piers in a vertically oriented, generally planar, and substantially two-dimensional array, and

said bridge structure comprises a longitudinal plurality of bays, each of the plurality of bays including a plurality of transversely spaced and longitudinally-extending beams which rest upon cross-beams of the piers, and a plurality of longitudinally-spaced and transversely-extending joists interconnecting said beams whereby an assembly of said beams and said joists form together each of the plurality of bays in a horizontally oriented, generally planar, and substantially two-dimensional array.

4,290,717
MACHINERY SAFETY GUARDS

Douglas E. Aslen, 16 Pinfold La., Romiley, Cheshire, England

Continuation-in-part of Ser. No. 800,549, May 25, 1977, abandoned. This application Dec. 19, 1978, Ser. No. 971,080
Claims priority, application United Kingdom, May 28, 1976, 22389/76
Int. Cl.[3] B23B *47/00*
U.S. Cl. 408—241 G 4 Claims



1. A machinery safety guard for encircling a tool comprising a mounting ring for application to a non-rotatable part of a drilling machine or the like in generally coaxial relationship with the tool to be carried by such a machine; a generally tubular guard body releasably attachable to the said mounting ring; resilient, yieldable, retention means attaching the upper end of said guard body to said mounting ring for quick release thereof by an extraction force; a guard sleeve slidably mounted on said body and freely movable in the axial direction thereof, the sleeve being adapted and arranged so as to make visible the region of the drilling tool; respective access slots in the guard body and guard sleeve each extending upwardly from an open end in the lower edges thereof to facilitate application of the guard body to, and its removal from, the mounting ring in the presence of a drill bit, the open ended slots being of a lesser length than the elements in which the slots are respectively provided; at least one pin on the guard body for cooperation with at least one nearly vertical, sharply inclined slit in the sleeve, thereby to impart a rotational motion between the body and guard on relative axial motion therebetween to effect angular displacement, for a distance slightly greater than the width of an access slot, between the said access slots on such axial motion; whereby the respective open ended access slots in the guard body and guard sleeve register in radial and axial alignment in the retracted position of the sleeve on the body but are angularly spaced in the peripheral direction of the guard in the operative position of the sleeve to at least partially close the lower said access slot in said guard sleeve during use.

2. A machinery safety guard for encircling a tool comprising a mounting ring for application to a non-rotatable part of a drilling machine or the like in generally coaxial relationship with the tool to be carried by such machine, a generally tubular guard body releasably attachable to the said mounting ring,

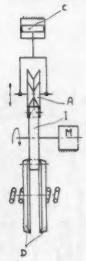
resilient, yieldable, retention means attaching the upper end of said guard body to said mounting ring for quick release thereof by an extraction force, a guard sleeve slidably mounted on the said body and freely movable in the axial direction thereof, the sleeve being adapted and arranged so as to make visible the region of the drilling tool, wherein the mounting ring is a hollow, unsplit bylinder of predetermined diameter free of slots and includes an integral, split clamping collar of reduced diameter arranged in closely spaced parallel disposition relative to the body of the mounting ring, the collar and ring body being one piece and secured together at one location, and the collar being split at an opposed diametrical location and having radial lugs thereat to receive a clamping bolt.

4,290,718

TOOLS FOR BEVELLING AND DEBURRING GEARS

Carlo Occhialini, Bologna, Italy, assignor to Samputensili S.p.A., Bologna, Italy

Filed Apr. 24, 1978, Ser. No. 899,468
Claims priority, application Italy, May 3, 1977, 3420 A/77
Int. Cl.[3] B23F *19/10*
U.S. Cl. 409—8 **13 Claims**



11. A tool for bevelling and deburring gear teeth of gears, comprising

a first member forming a gear-shaped, toothed bevelling tool, having profiled teeth each formed with two sides, said sides being engageable simultaneously with four corners of gear teeth of gears to be bevelled,

both of said sides of said profiled teeth being straight and adjacent of said sides of adjacent of said profiled teeth all being inclined relative to an axis of the gears to be bevelled and tapering convergingly in a lateral direction away from the bevelling tool, and defining spaces therebetween adapted to receive the gear teeth of gears to be bevelled, said profiled teeth of each one of said cooperating parts define narrowmost bases opposite and freely spaced apart from each other with nothing therebetween at variable distances depending on the thicknesses of the gear teeth of the gears to be bevelled such that various thicknesses of the gear teeth of the gears to be bevelled can be accommodated between and contacting all said adjacent sides of said profiled teeth with said cooperating parts and said bases displaceable apart accommodatingly relative to each other, whereby both sides of the gear teeth of said gears to be bevelled are bevelled simultaneously by both said adjacent sides of said adjacent teeth of said cooperating parts, respectively,

a second member comprising a pair of deburring discs, said deburring discs having smooth profiles inclined relative to each other,

axial take-up means for always pressing said profiles of said deburring discs against opposite lateral sides of the gear teeth of said gears to be bevelled and deburred on only one continuous circumferential line,

means for keeping said two cooperating parts of said bevelling tool pressed against a gear being bevelled during an entire bevelling operation, whereby as a result of both said means all bevelling and deburring are performed with the same nominal dimensions,

a first axis,

a second axis, parallel to said first axis

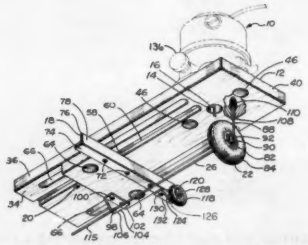
said bevelling tool and said deburring discs being respectively mounted coupled on said two separate parallel axes.

4,290,719

CUTTING GUIDE

Ronald L. Worthington, deceased, late of Selah, Wash., and by Florence Worthington, administratrix, 603½ B, N. 20th Ave., Yakima, Wash. 98902

Filed Jul. 19, 1979, Ser. No. 59,061
Int. Cl.[3] B23C *1/20*
U.S. Cl. 409—180 **11 Claims**



1. A cutting guide for use with a power unit having a powered cutting tool to cut strips of materials from a larger sheet, said cutting guide comprising:

(a) a manually graspable base plate having an opening for receiving the cutting tool downwardly therethrough;

(b) means for mounting said power unit on said base plate;

(c) an elongate fence disposed below said base plate, said fence having a leading and a trailing end portion, and an upright work piece contacting guide face directed toward said base plate tool receiving opening;

(d) carriage means moveable along the bottom surface of said base plate for securely supporting said fence in selective locations relative to said base plate tool receiving opening; and

(e) strip support means cooperatively carried by said base plate and said carriage means for supporting the cut strip upwardly against the bottom surface of said base plate, said strip support means comprising:

a support roller disposed below said base plate at a location rearwardly of said cutting tool receiving opening and laterally between the central axis of said cutting tool receiving opening and said fence;

axle means for rotatably mounting said roller along an axis extending parallel to the bottom surface of said base plate and perpendicularly to the length of said fence guide face, and

means fur urging said roller upwardly towards the bottom surface of said base plate.

4,290,720

QUICK SELF-RELEASE AND RELOAD TOOLING DEVICE

Roberto J. Ferreira, Bellflower, Calif., assignor to R. F. B. Engineering Inc., Garden Grove, Calif.

Filed Dec. 17, 1979, Ser. No. 104,111
Int. Cl.[3] B23B *5/26, 31/10, 5/22*
U.S. Cl. 409—233 **4 Claims**

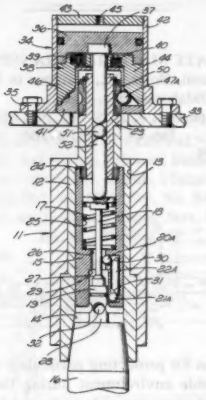
1. In a machine tool having a machine body and a rotatable machine spindle, a quick self-release and reload tooling device for a rotatable tool element, tool said device comprising:

a tool-holder device with an appendage and a plurality of radially disposed recesses on said appendage,

a tool-holder chuck device with locking means mounted within said machine spindle, said chuck having an axially disposed bore with three different diameters, a spring loaded shaped plunger means disposed within said bore and axially movable therein,

at least one radially disposed first hole communicating with said axial bore and having a first sphere disposed therein,

at least one radially disposed second hole axially displaced from said first hole and with said axial bore and having a second sphere disposed therein, axially inward of one end



of said chuck, a second bore disposed to communicate with said first and second hole, and a shaped pin disposed in said second bore and disposed to move axially therein, and

an axially perforated draw bar means with a free rotating gripper collar means,

disposed on said machine at the other end of said chuck means having an air cylinder means and with locking and pushing means concentric with and axially in line with said spindle means.

4,290,721

TOOL HOLDER ASSEMBLY FOR A PORTABLE POWER TOOL

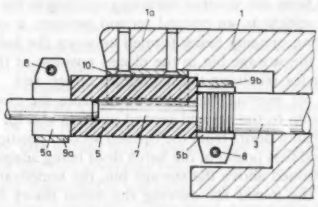
Fritz Knoll, Konradigasse 21, D-7750 Constance, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,486

Claims priority, application Switzerland, Nov. 6, 1978, 11408/78

Int. Cl.[3] **B23C** *1/20*; **B23B** *31/00*

U.S. Cl. 409—234 **10 Claims**



1. A toolholder assembly incorporated in a portable power tool having a housing and a drive means disposed therein comprising in combination:

(a) a plastic toolholder body having a front end for carrying a tool bit;

(b) a first clamping assembly at a rear end of the toolholder body for releasably securing the toolholder body to the drive means for oscillating the toolholder body in a longitudinal direction by the drive means; said first clamping assembly including

(1) a first clamping yoke and

(2) a first tightening screw carried by said first clamping yoke;

(c) a second clamping assembly at said front end of said toolholder body for releasably securing a rear shank of the tool bit to said toolholder body; said second clamping assembly including

(1) a second clamping yoke and

(2) a second tightening screw carried by said second clamping yoke;

(d) longitudinal guide faces provided on said toolholder body between said first and second releasable securing means; and

(e) a bearing member mounted in said housing and provided with longitudinal counterguide faces slidably cooperating with said longitudinal guide faces of said toolholder body for taking up forces transverse to the direction of the longitudinal oscillation of said toolholder body.

4,290,722

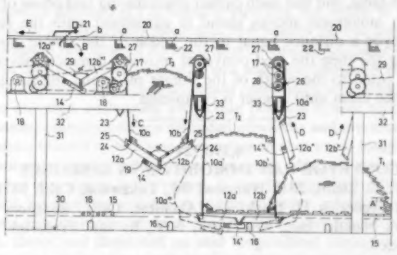
METHOD FOR USING TIMBER SORTING COMPARTMENTS AND A SORTING COMPARTMENT FOR SAID METHOD

Alpo Rysti, Friisilantie 36, 02240 Espoo 24, Finland; Seppo Anttila, Vantaa, and Veijo Maki-Hoimela, Espoo, both of Finland, assignors to Alpo Rysti, Espoo, Finland

Filed Aug. 6, 1979, Ser. No. 64,116

Int. Cl.[3] **B65G** *65/00*

U.S. Cl. 414—48 **9 Claims**



1. A method for the use of timber sorting compartments, in which method a sorting compartment is filled with timber pieces (a,), after which the sorting compartment is opened and the accumulated timber lot (T_2) is allowed to discharge onto take-up equipment (**15**), by means of which the timber lot is then carried on to be further processed, after which the compartment is closed to be ready to receive the next timber lot; wherein the method comprises the steps of:

accumulating the timber lot (T_2) upon rigid supporting arms (**12***a*,**12***b*) suspended and extended by pairs of flexible suspending means (**10***a*,**10***b*), these means being located on both sides of the accumulated timber lot (T_2);

lengthening the pairs of flexible suspending means (**10***a*,**10***b*), then opening or allowing the supporting arms (**12***a*,**12***b*) to open;

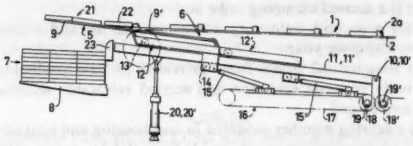
lifting the supporting arms (**12***a*'',**12***b*'') independently and by separate paths to a top position by shortening the pairs of flexible suspending means (**10***a*,**10***b*);

locking the supporting arms (**12***a*''',**12***b*''') to form a closed bottom of the compartment for receiving pieces of the next timber lot, and repeating the phases for the next timber lot.

4,290,723
TIMBER PACKAGE ARRANGER

Jan Johansson, Byske, Sweden, assignor to Renholmens Mekaniska Verkstad AB, Byske, Sweden

Continuation of Ser. No. 802,345, Jun. 1, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,568
Int. Cl.³ B65G *57/10*
U.S. Cl. 414—83 **5 Claims**

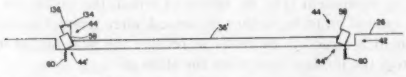


1. An apparatus for assembling timber output at the delivery end of a feed conveyor in packages of layers with or without sticks between the layers, comprising a device for transferring a layer of a predetermined number of timber pieces advanced one at a time to a liftable and lowerable stacking table provided after the conveyor in its feed direction, on which table the layers are positioned by the transfer device and stacked one above the other to form a timber package, and which is adapted with the growth of the timber package to correspondingly move in steps until the package is completed, characterized in that the feed conveyor delivers timber pieces in equally spaced relationship, the transfer device is provided in direct connection to the delivery end of the feed conveyor and comprises at least two carrier planes movable individually and after one another in a cyclic path, of which carrier planes always one in a phase of its cyclic movement constitutes a continuation of the feed conveyor for receiving timber pieces delivered from said conveyor to form a layer, which then is transferred by the same, and that each carrier plane during said phase of its cyclic movement moves ahead in agreement with the feed conveyor a distance equal to the width of the timber piece during the time the feed conveyor moves a distance substantially equal to the width of the timber piece and the spacing between them until a layer is completed.

4,290,724
CONVEYOR PAN IMMOBILIZING ASSEMBLY

Robert D. Lichti, 3318 Warwood Rd., Lakewood, Calif. 90712, and Frederick D. Hock, Los Alamitos, Calif., assignors to Park Mobile, Inc., New York, N.Y., by said Frederick D. Hock

Continuation-in-part of Ser. No. 873,520, Jan. 30, 1978. This application Dec. 26, 1979, Ser. No. 107,328
Int. Cl.³ E04H *6/14*
U.S. Cl. 414—251 **7 Claims**



1. A conveyor pan immobilizing assembly for immobilizing a conveyor pan having two opposite sides in a direction substantially perpendicular to the conveyed direction of the conveyor pan yet permitting movement of the conveyor pan in the conveyed direction, said assembly comprising

first and second subassemblies mounted for respective engagement with the sides of the conveyor pan that are substantially parallel to the conveyed direction, each subassembly comprising:

a roller for engaging the pan side;

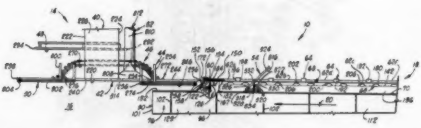
means for rotatably mounting said roller; and

means for resiliently mounting said roller for movement in the substantially vertical direction, said roller being mounted such that the surface thereof when in engagement with the respective pan side forms an acute included angle with the vertical axis, said resilient mounting means comprising a housing; an elongate bracket, one end of said bracket rotatably mounting said roller and the other end of said bracket being pivotally mounted in said housing about a first pivot for a predetermined amount of rotation in a first direction and about a second pivot after continued rotation in said first direction beyond said predetermined amount of rotation; and spring means for resiliently urging said one end of said bracket in an upward direction.

4,290,725
PARTICULATE MATERIAL TRANSFER SYSTEM

Weldon K. Johnson, Boise, Id., assignor to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Filed Oct. 4, 1979, Ser. No. 81,888
Int. Cl.³ B65G *67/06*
U.S. Cl. 414—329 **19 Claims**



1. An apparatus for protecting particulate material from the surrounding outside environment during the transfer of the material from a storage assembly to a vehicle comprising:

a loading chute having a lower end and a channel extending therethrough, the channel being in communication with the storage assembly for transferring the particulate material from the storage assembly through the channel in the loading chute;

a temporary cover having an upper surface, a lower surface, a first end, an opposed second end, a first side, an opposed second side, the temporary cover being connected to the lower end of the loading chute with the channel of the loading chute extending through the temporary cover;

a body forming a portion of the vehicle having a first end, a second end, a first side, a second side, an upper side and a lower side, the body having a storage bin formed therein and the upper side of the body having a material receiving opening therein communicating with the storage bin;

a first cover assembly, comprising:

at least one hatch door having a first side, an opposed second side, a first end and an opposed second end, the hatch doors being connected to the body of the vehicle and positioned so that the hatch doors cover the material receiving opening of the body of the vehicle in a closed first position, the hatch doors each being movable from the material receiving opening in the body of the vehicle to an opened second position, a cover receiving opening being formed between the hatch door and the storage bin in the closed position of the hatch door for receiving the temporary cover; and

means for moving the hatch doors from the closed first position to the opened second position and for moving the hatch doors from the opened second position to the closed first position, the hatch door being adapted to be positioned above the storage bin, the temporary cover and the means for moving the hatch doors from the closed first position to the opened second position cooperating to position at least a portion of the temporary cover in the cover receiving opening between the storage bin of the vehicle and the hatch door prior to the hatch door being moved from the closed first position to the opened second position, the temporary cover being positioned over and covering a portion of the storage bin of the vehicle covered by the hatch door in the closed first position of the hatch door thereby cov-

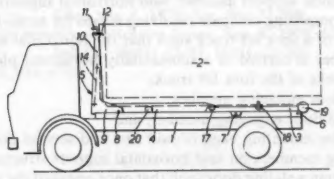
ering the storage bin of the vehicle prior to the hatch door being moved to the opened second position, the particulate material being transferrable from the overhead storage bin to the storage bin of the vehicle via the channel in the chute while the temporary cover covers the storage bin of the vehicle.

4,290,726

EQUIPMENT FOR LOADING OF AN EXCHANGE PLATFORM OR CONTAINER

Leo Sutela, Turku, and Heikki Laitinen, Raisio, both of Finland, assignors to Oy Partek AB, Raisio, Finland

Filed Oct. 12, 1979, Ser. No. 84,059
Claims priority, application Finland, Nov. 8, 1978, 783401
Int. Cl.³ B60P *1/64*
U.S. Cl. 414—421 **5 Claims**



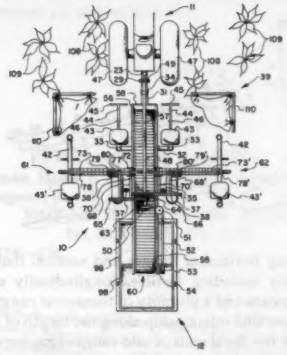
1. Apparatus provided on a vehicle for moving an exchangeable container onto the vehicle and for removing same from the vehicle and for tipping the container when mounted on the vehicle, said apparatus comprising a rear frame pivotably connected at its rear end to the rear end of the vehicle, a second frame pivotably connected at one end to said rear frame, a substantially L-shaped member having one limb pivotably connected to said second frame, the other limb of said L-shaped member being provided at its outer end with engaging means for engaging a member provided on the front end of the container, a first piston and cylinder device having one end connected to the vehicle and its other end connected to the second frame for pivoting the second frame, and a second piston and cylinder device arranged between the L-shaped member and the second frame for pivoting the L-shaped member about its pivot connection with the second frame, said L-shaped member being divided longitudinally from a point below the engaging means to form two branches which diverge from each other transversely of the vehicle and which at their lower end extend rearwardly to form said one limb, the forward end of said second frame extending forwardly beyond the pivot connection between the L-shaped member and said second frame by a distance substantially corresponding to the length of the parts forming said one limb of the L-shaped member, said second piston and cylinder device being located between said two diverging branches of the L-shaped member and being connected to said other limb and to the second frame at a position forwardly of the pivot connection between the L-shaped member and the second frame, the length of the cord between the position of the engaging means when said other limb is vertical and the position of the engaging means when the L-shaped member has been pivoted by the full stroke of the second piston and cylinder device about the pivot connection with the second frame being substantially double the length of said one limb of the L-shaped member, and said other limb of the L-shaped member being longer than said one limb.

4,290,727

HARVESTING DEVICE

William E. Davis, Sr., Kinston, N.C. 28501

Continuation-in-part of Ser. No. 947,578, Oct. 2, 1978, abandoned. This application Feb. 28, 1979, Ser. No. 16,189
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—508 **13 Claims**



1. A harvesting device of the tobacco type comprising: a frame means; a pair of front seat means mounted one on each side of said frame means and adjacent thereto; a foldable foot rest means mounted adjacent each of said front seat means whereby when said harvesting device is towed behind a separate vehicle, said foot rest can be folded out of the way during sharpe articulated turns; a pair of rear seat means mounted one on each side of said frame means outwardly of said front seat means a distance approximately equaling the width of a crop row; a longitudinally disposed, rearwardly driven conveyor means in the form of an open interconnected plurality of rod-like fingers mounted on said frame and extended from adjacent and between said front seat means rearwardly and upwardly to an elevated, outwardly projecting position behind said frame means; conveyor means extended upwardly and inwardly from adjacent each of said rear seat means to above said longitudinal conveyor means whereby as the crop adjacent each of said front seat means is harvested, it can be deposited directly on said longitudinal conveyor and as the crop adjacent each of said rear seat means is harvested, it can be conveyed therefrom to above and deposited on said longitudinal conveyor; and a crop receiving means articulatingly connected to and disposed rearwardly of said frame means below the rear portion of said longitudinal conveyor means whereby an improved harvester means is provided.

4,290,728

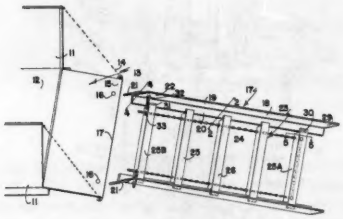
RAMP TO LOAD AND UNLOAD VEHICLES INTO AND FROM A TRUCK BODY

Lucien Leduc, Box 368, Assiniboia, Saskatchewan, Canada

Filed Sep. 10, 1979, Ser. No. 74,252
Claims priority, application Canada, Sep. 20, 1978, 311698
Int. Cl.³ B65G *67/02, 69/28*
U.S. Cl. 414—537 **12 Claims**

1. A ramp assembly for use with a truck body which includes a tail gate and means to support said tail gate when opened, at an inclined angle extending outwardly and downwardly towards the ground; said ramp assembly comprising in combination a pair of spaced and parallel, longitudinally extending stringers, having tail gate engaging ends and ground engaging ends, and a flexible ladder assembly operatively connected by one end thereof to adjacent one end of said stringers and rollable along said stringers from a rolled stored position, to an unrolled extended position and vice-versa, means to detachably secure the other end of said ladder assem-

bly to adjacent the other ends of said stringers when in the unrolled extended position, means to support said ladder assembly upon said stringers when in the unrolled extended position and means operatively and detachably connecting said stringers to said tail gate by said tail gate engaging ends thereof whereby said stringers extend downwardly and outwardly from said tail gate to the ground, said stringers comprising



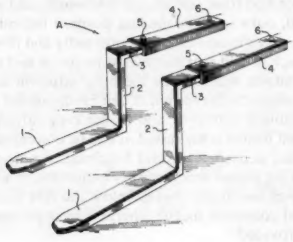
members having horizontal flanges and vertical flanges, said ladder assembly including flexible, longitudinally extending rung support means and a plurality of transverse rungs secured in spaced and parallel relationship along the length of said rung support means, the distal ends of said rungs engaging upon and being supported by the horizontal flanges of said stringers, the vertical flanges of said stringers acting as guide rails for the vehicle driven thereon.

4,290,729

ANGULAR DETACHABLE EXTENSIONS TO THE FORKS OF FORK LIFT TRUCKS

Arthur P. Cary, 2519 Farrington St., Dallas, Tex. 75207

Filed Nov. 20, 1978, Ser. No. 962,552
Int. Cl.³ B66F *9/06*
U.S. Cl. 414—607 **4 Claims**



1. In a fork lift truck having wheels supporting the truck from a horizontal floor at one height and including forwardly extending forks adapted for vertical travel from the floor to a height above said floor, the improvement comprising:

a. a modified S-shaped extension removably attached to said forks,

b. surrogate forks at the distal end of said extension to engage a load,

c. structural means in said extension between said point of attachment to said forks and the point of engagement with a load to position said surrogate forks at a lower level than said floor, whereby a load at said lower level may be lifted to and above said floor level for relocation on said floor by said truck, and wherein

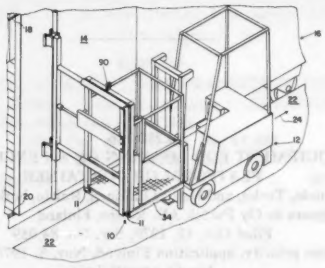
d. said modified S-shaped extension includes first horizontal member sections which comprise tubular members that removably and slideably engage said forks, and also slideably engage other members of said extension.

4,290,730

ATTACHMENT FOR FORK LIFT

James A. Weaver, Topeka, Kans., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 13, 1980, Ser. No. 129,914
Int. Cl.³ E05F *13/02*; B66F *9/19*
U.S. Cl. 414—607 **7 Claims**



1. An attachment for a fork lift truck for opening or closing a sliding door comprising:

a horizontal support member, said horizontal support member comprising elongate receiving means for receiving the forks of a fork lift truck such that the horizontal support member is carried in a substantially horizontal plane on the forks of the fork lift truck;

a first door engaging member;

a second door engaging member; and

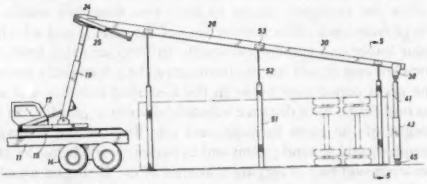
means for mounting each of said first and second door engaging members on said horizontal support structure for engaging a sliding door such that once engaged the sliding door can be moved by movement of a fork lift truck on which the attachment is carried, said first and second door engaging members being separated in a vertical direction a substantial distance whereby the upper of said door engaging members is adapted to engage a region of a sliding door a substantial distance above a region of the sliding door which is adapted to be engaged by the lower of said door engaging members.

4,290,731

APPARATUS FOR PICKING UP OVERTURNED VEHICLES

John A. Griffith, 8935 Solon, Houston, Tex. 77064

Filed Mar. 26, 1979, Ser. No. 23,690
Int. Cl.³ B66C *1/20, 23/78*
U.S. Cl. 414—678 **13 Claims**



1. Emergency vehicle apparatus for engaging and uprighting an overturned elongate trailer or the like which comprises:

(a) a truck-borne framework comprising first and second telescopically connected frame members having a specified lengthwise extent;

(b) a truck-borne frame member being pivotally interconnected with said first frame member and being rotatable and elevatable relative to said truck for adjusting the height and position of said first and second frame mem-

bers, said truck-borne frame member extending said first and second frame members approximately parallel to and along an overturned vehicle;

(c) at least a pair of elongate slings supported by said frame members which are adapted to be selectively placed around and beneath an overturned vehicle;

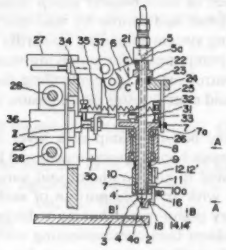
(d) means for selectively raising said slings to raise and elevate an overturned vehicle supported on said slings;

(e) end located support leg means affixed to the end portions of said first and second frame members to enable said first and second frame members to be extended approximately over an overturned vehicle such that said leg means is located at one end of the overturned vehicle and the emergency vehicle apparatus is located at the other end thereof, said support leg means having ground contacting means facilitating movement of said end support leg means on the ground to permit movement of the vehicle to another location.

4,290,732
APPARATUS FOR CARRYING AND PLACING COMPONENTS

Yasuo Taki, Hirakata; Shigeru Araki, Katano; Kazuhiro Mori, Katano; Yoshihiko Misawa, Katano, and Souhei Tanaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed Sep. 6, 1979, Ser. No. 72,850
Claims priority, application Japan, Sep. 8, 1978, 53-111187
Int. Cl.³ B65G *47/91;* H01L *21/58*
U.S. Cl. 414—752 **4 Claims**



1. An apparatus for carrying and placing components, comprising:

a body frame fixed at a position;

a rod means movably supported on said body frame for movement in the vertical and horizontal directions;

a moving means connected to said rod means for moving said rod means in the horizontal direction;

a further moving means connected to said rod means for moving said rod means in the vertical direction;

a suction tool on the lower end of said rod means for picking up a component;

suction means connected to said suction tool for supplying a vacuum to said suction tool when the suction tool is carrying a component;

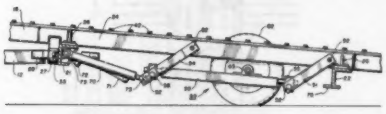
at least one pair of positioning pawls rotatably mounted on said rod means and having free ends for grasping and positioning a component therebetween when the free ends are moved toward each other; and

a means for rotating said positioning pawls in synchronization with the movement of said rod means and having a first spring connected between the pawls in each pair and urging the free ends of said pawls toward each other, a pawl supporting member slidable on said rod means, a second spring engaging said pawl supporting member and urging the pawl supporting members and pawls along said rod means in the axial direction thereof toward said suction tool, and at least one pin on said rod means and engaged by said pawls as said pawls move toward said suction tool for urging said pawls apart to move the free ends away from each other against the action of said first spring, whereby said pawls have the free ends apart when the suction tool on the rod means is in the lowered position for picking up or positioning a component, and when said rod means is moved to the raised position, said free ends are moved together by said first spring for engaging the free ends with a component picked up by said suction tool from opposite directions for properly positioning the component on said suction tool.

4,290,733
FORAGE STACK MOVER

Fritz Lahman, Hecla, S. Dak., assignor to Lahman Manufacturing Company, Inc., Hecla, S. Dak.

Filed Jan. 28, 1980, Ser. No. 115,945
Int. Cl.³ B60P *1/18, 1/36*
U.S. Cl. 414—476 **8 Claims**



1. A mobile machine adapted to be drawn behind a prime mover for loading, unloading, and transporting a forage stack, comprising:

a. a frame mechanism having one end thereof constructed and arranged for engagement with the draw bar of the prime mover;

b. a bed mechanism having a plurality of longitudinal beam members secured to a plurality of transversely oriented longitudinally spaced cross brace members;

c. means rigidly securing said frame mechanism to the front of said bed mechanism and securing each against movement with respect to the other;

d. a plurality of endless chain elements having teeth extending normally from said chain for engaging the forage stack, said chain elements disposed on a plurality of said elongated beam members;

e. a drive mechanism operably connected to said plurality of endless chain elements for driving the same in unison while loading and unloading a forage stack;

f. a pair of fourbar linkages, each of which has a pair of substantially vertically extending arms spatially disposed longitudinally and pivotally secured at their upper ends to one of said plurality of elongated beam members, the lower ends of said pair of arms being pivotally joined to a longitudinally extending carriage member;

g. a pair of wheels supported on a transverse axle secured to each of said longitudinally extending carriage members;

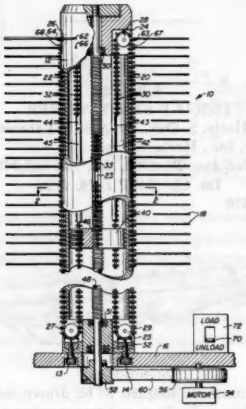
h. a pair of journal blocks pivotally connected to the lower ends of said pair of vertically extending arms about axes transverse to said longitudinal beam members, said journal blocks having a pair of journal boxes with bores at right angles to said axes in said journal blocks, said longitudinally extending carriage members having ends extending through said journal box bores;

i. and extensible means operably connected between said bed mechanism and said pair of fourbar linkages, said extensible means moving said carriage members vertically away from said bed and frame mechanisms during transporting of the mobile machine and moving said carriage members in vertical proximity to said bed and frame mechanisms during loading and unloading of the mobile machine.

4,290,734
RIGID DISC HANDLING DEVICE AND METHOD

Abraham J. Van Breen, Sunnyvale, Calif., assignor to Dysan Corporation, Santa Clara, Calif.

Filed May 19, 1980, Ser. No. 150,847
Int. Cl.[3] B65G 1/12
U.S. Cl. 414—786 15 Claims



1. Apparatus for stacking rigid magnetic discs having a central aperture, said apparatus comprising:

a hollow elongate member having external cross sectional dimensions slightly less than the inner dimensions of the central apertures of the discs, the outer surface of said member having at least two elongate axial recesses each terminating at openings at both ends of the recesses;

at least two endless loops supported proximate the openings so that the chains traverse the respective recesses and return within the elongate member, each said loop having a plurality of spaced nibs projecting outwardly beyond the outer surface of the elongate member;

a drive element located within the elongate member and attached to each of the loops; and

means for moving the drive element axially within the elongate member to move the loops in unison and allow serial loading and unloading of magnetic discs on the elongate member on sequential nibs of the loops.

14. A method for stacking rigid magnetic discs having central apertures comprising the steps of:

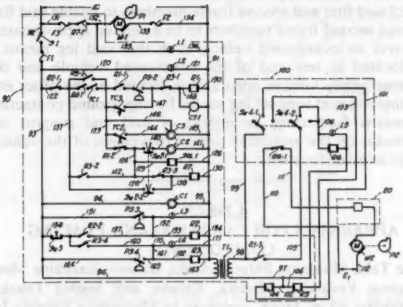
loading the discs by sequentially placing the discs over an elongate member into contact with the initial exposed projecting nibs of at least two endless loops axially disposed at the surface of the elongate member, sensing the presence of each disc in contact with the initially exposed nibs, and automatically moving the loops in unison a distance equal to the spacing between nibs upon sensing the presence of each disc so that the discs are spaced from one another along the elongate member by the loops; and

unloading the discs by sequentially removing the discs in contact with the initial exposed projecting nibs of the loops, sensing the removal of each disc in contact with the initially exposed nibs, and automatically moving the loops in unison a distance equal to the spacing between nibs upon sensing the absence of each disc to place the next disc in position to be removed.

4,290,735
WATER PRESSURE BOOSTER SYSTEM

James C. Sulko, Tucker, Ga., assignor to Syncroflo, Inc., Atlanta, Ga.

Filed Jun. 8, 1979, Ser. No. 46,772
Int. Cl.[3] F04B 49/02
U.S. Cl. 417—2 17 Claims



1. In a water booster system for buildings of the type having a main booster system including main booster pump means having a suction side and a discharge side, said suction side being connected to a source of water, a piping system having fixtures on various floors within said building and connected to the discharge side of main booster pump means for receiving water pumped from said source by said main booster pump means, said piping system extending upwardly in said building from said main pump means for supplying water to all of said fixtures, and control means for controlling the actuation and deactuation of said main booster pump means, the combination therewith:

(a) an auxiliary booster pump at a level in said building above said main booster pump means and having a suction side connected to and on one of said various floors communicating with an upper portion of said piping system, said auxiliary pump means having a discharge side;

(b) an accumulator tank communicating with said discharge side of said auxiliary pump means for receiving water from the discharge side of said auxiliary pump means; and

(c) means for releasing the water in said accumulator tank to said piping system.

4,290,736
OIL PUMP HAVING A SUCTION AND PRESSURE PIPE ARRANGEMENT

Felix Bernasconi, Zollikerberg, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Sep. 7, 1978, Ser. No. 940,192
Claims priority, application Switzerland, Sep. 7, 1977, 10924/77
Int. Cl.[3] F04B 23/14; F04C 2/18
U.S. Cl. 417—87 1 Claim

1. A driven oil pump, of the type which is preferably driven only in one direction, comprising:

a housing mounted on a base;

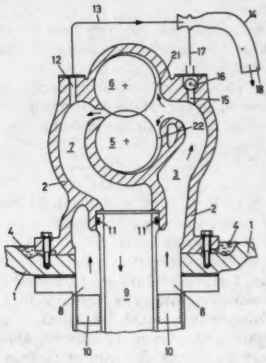
a pair of rotatable pump elements provided within the housing and having an intake side and a discharge side;

a suction chamber communicating with the intake side of the pump elements, the suction chamber being substantially within the housing and having substantially crescent-shaped portions at the intake side of the rotatable pump elements;

a pressure chamber communicating with the discharge side of the pump elements, the pressure chamber being substantially within the housing;

a suction pipe communicating with the suction chamber;

a pressure pipe communicating with the pressure chamber and concentrically disposed within the suction pipe such that a longitudinal axis of the pressure pipe intersects a rotational axis of each of the pump elements whereby the pump accommodates an opposite driving direction by a 180° turn of said housing around the longitudinal axis of the pressure pipe;



venting means for venting the suction chamber; and

an oil sump which communicates with the base and the housing at the location of mounting to provide a seal between the housing and the base, and wherein the venting means vents to the oil sump.

4,290,737

RAM TYPE PUMP

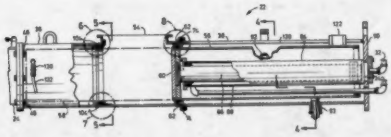
Tymen Clay, 280 Huntingdon Ave., Stratford, Ontario, Canada (N5A 6P9)

Filed Sep. 25, 1979, Ser. No. 78,884

Claims priority, application Canada, Sep. 14, 1979, 335715

Int. Cl.³ F04B *15/02*

U.S. Cl. 417—403 **12 Claims**



1. A ram type pump for a manure handling system, said pump comprising:

a hollow, cylindrical pump housing having a transfer portion and an actuator portion, the transfer portion defining an outlet opening and an inlet hopper;

a cylindrical ram slidably located for reciprocating movement in the housing past the hopper, the ram being adapted to push manure entering the hopper through the transfer portion;

a releasable coupling connected between said transfer portion and said actuator portion at the junction thereof, the actuator portion thereby being separable from the transfer portion by releasing said coupling;

actuator means located in said actuator portion connected between the ram and said actuator portion for reciprocating the ram; and

guide means located in said actuator portion for axial alignment of the ram in the housing, said guide means comprising a plurality of bearing pads extending radially inwardly from said actuator portion to slidingly engage the cylindrical ram.

4,290,738

STEERING VALVE WITH SPRING TORSION ROD

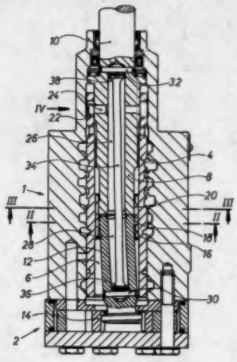
Karl-Heinz Liebert, Schwabisch Gmund, and Werner Tischer, Bobingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 73,611

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1978, 2810970

Int. Cl.³ F01C *1/10*; F16D *31/04*

U.S. Cl. 418—61 B **4 Claims**



1. For use in a hydrostatic vehicle steering system having a pump (2) provided with a rotor (14), a steering control valve (1) for actuating the pump including a pump element (4), a drive shaft (10), a universal shaft (12) having a driven end pivotally and torsionally connected to the rotor, a spring torsion rod (34) having opposite ends coupled to the universal shaft and the drive shaft, and means (22, 24) responsive to torsional strain of the torsion rod for angularly displacing the valve element relative to the drive shaft; the improvement residing in articulated connecting means (32 and 30) for coupling said opposite ends (36 and 38) of the torsion rod to the drive shaft and said driven end of the universal shaft to minimize transmission of unbalanced radial forces to the valve element through the universal shaft.

4,290,739

HELICAL GEAR PUMP OR GEAR MOTOR WITH OPTIMAL RELIEF GROOVES FOR TRAPPED FLUID

Theodorus H. Korse, De Hazelaar 111, 6903 BD Zevenaar, Netherlands, assignor to Theodorus H. Korse, Delft, Netherlands

Filed Mar. 8, 1979, Ser. No. 18,718

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1978, 2810563

Int. Cl.³ F03C *2/08*; F04C *2/16, 15/02*

U.S. Cl. 418—189 **5 Claims**

1. A gear pump or gear motor comprising

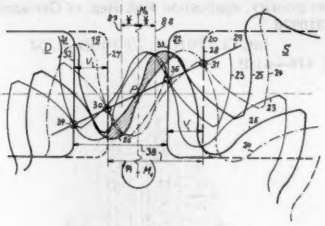
a pair of intermeshing driving and driven helical gears, a housing surrounding said gears and providing pressure ports and suction ports leading to said gears,

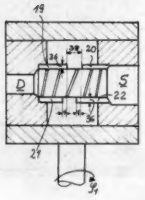
pressure port connected and suction port connected relief grooves, formed in the meshing area in the housing and/or the stationary parts, positioned in the pump,

said relief grooves facing the lateral faces of the helical gears; said pressure port connected and suction port connected relief grooves at the leading lateral face of the helical gears having been shifted, out of the symmetrical position with respect to the plane through the two rotation axes, over a distance V/2 in the direction of the suction port,

said pressure port connected and suction port connected

relief grooves at the lagging lateral face of the helical gears having been shifted, out of the symmetrical position with respect to the plane through the two rotation axes, over a distance V/2 in the direction of the pressure port, said distance V/2 having been given that value, that an enclosed tooth cavity is connected via the pressure port connected relief grooves with the pressure port, only with





decreasing size of the area of the enclosed tooth cavity, considered in the transversal plane through the middle of the gears and that an enclosed tooth cavity is connected via the suction port connected relief grooves with the suction port, only with increasing size of the area of the enclosed tooth cavity, considered in the transversal plane through the middle of the gears.

4,290,740

ROTARY DRUM PLANT FOR THE MANUFACTURE OF CONCRETE, REINFORCED CONCRETE AND/OR PRESTRESSED CONCRETE PRODUCTS

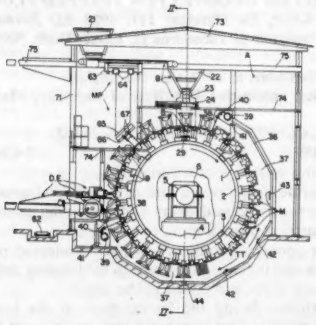
Mircea Borcoman, 8, rue des Dardanelles, 75017 Paris, France

Filed Nov. 15, 1979, Ser. No. 94,679

Claims priority, application France, Nov. 22, 1978, 78 32891

Int. Cl.[3] B28B *5/04, 5/10, 3/00, 13/05, 23/04*

U.S. Cl. 425—62 **10 Claims**



1. Plant for the manufacture of concrete, reinforced concrete and/or prestressed concrete products comprising a rotary drum with a horizontal axis of rotation, lined over its outer cylindrical surface with molding means and adapted to pass said molding means during its rotation, in front of various working stations, notably stations for concreting, for hardening, for demolding and for positioning cores, wherein the drum is equipped with beams with a composite profile fixed, notably by welding, longitudinally, over the outer periphery of the drum; said beams:

(1) having a cross-section which has areas adapted to form a roller track parallel to the longitudinal axis of the drum for the rolling and guidance of the compacting means for the concrete,

(2) being equipped with fastening means for the molds in a position situated radially outwards with respect to the said roller track,

(3) having, in addition, sufficient mechanical strength to absorb the major part of the prestressing forces exerted on the cores in the case of the manufacture of prestressed concrete elements.

4,290,741

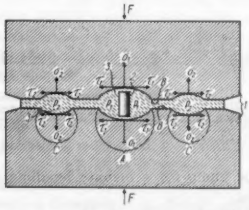
DEVICE FOR BUILDING-UP HIGH PRESSURE

Anatoly V. Kolchin, Simferopolsky proezd, 5, kv. 40; Vladimir I. Veprintsev, Chongarsky bulvar, II, korpus I, kv. 30; Lev I. Klyachko, ul. Televidenia, I9, korpus, 3, kv. 204; Alexandr S. Novgorodov, Timiryazevskaya ul., 34, korpus I, kv. 51; Vladimir M. Zubkov, Profsojusnaya ul. 39, kv. 45; Leonid F. Vereschagin, Kutuzovsky prospekt, 2/I, kv. 23, all of Moscow; Lev G. Khvostantsev, Shkolnaya ul., 4, kv. 62; Albert P. Novikov, Tsentralnaya ul, IO, kv. 59, both of Izmiran Moskovskaya oblast, Podolsky raion; By Sergei I. Yanshin, deceased, late of Moscow, Klavdia M. Yanshina; Elena S. Yanshina, both of Varshavskoe shosse, 6/8, kv. 145, Moscow; Ivan S. Yanshin, u. Ostrovskogo, 38, kv. 6, and Zinaida P. Yanshina, Krivoarbatsky pereulok, 6, kv. IO, both of Moscow, Administrators all of U.S.S.R.

Continuation of Ser. No. 547,343, Feb. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 498,667, Aug. 19, 1974, abandoned, which is a continuation of Ser. No. 424,079, Dec. 12, 1973, abandoned, which is a continuation of Ser. No. 261,636, Jun. 12, 1972, abandoned, which is a continuation of Ser. No. 104,231, Jan. 6, 1971, abandoned. This application Mar. 14, 1979, Ser. No. 20,409

Int. Cl.[3] B30B *11/32*

U.S. Cl. 425—77 **6 Claims**



1. In a device for building up pressure comprising a pair of identical coaxial dies facing each other, the dies being capable of being drawn together and having faces, outer peripheries and central sections, adapted to receive between the sections a specimen to be studied; a solid medium arranged between the central sections and adapted to surround the specimen being studied, the solid medium being capable of transmitting to the specimen the pressure build-up in the solid medium when the dies are being drawn together and means for confining the solid medium in the central sections when the dies are being drawn together; the improvement wherein the means for confining the solid medium consists of at least one annular circular groove located identically in each die in the face thereof concentrically outwardly of the central section and inwardly of the outer periphery of each die, said grooves being adapted to be filled with the solid medium and being defined by depressions whose inner and outer sides have annular raised arms,

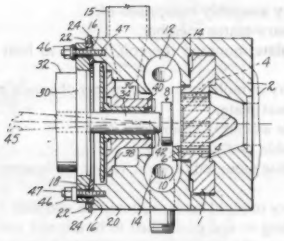
said grooves forming a toroidal space filled with the solid medium upon the closure of the dies, the outer side of the outermost annular circular groove of said at least one groove in each die when closed upon said solid medium being open to atmospheric pressure; said solid medium being a unitary body extending from the central section through to the outer side of said outermost circular groove; wherein the solid medium is selected from the group consisting of pyrophyllite, catlinite, or their combination.

4,290,742

ADJUSTABLE PELLETIZING APPARATUS

Hans R. Scharer, Woodbridge; Richard D. Antrim, Newtown, and John R. Strang, Ansonia, all of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Oct. 11, 1979, Ser. No. 83,675
Int. Cl.³ B29B *1/03*
U.S. Cl. 425—313 **4 Claims**



1. In a pellet cutting apparatus in which one or more rotatable blades are adapted to cut plastic strands extruded through a cutting surface of a perforated die plate including:

a housing support mounting the die plate for extrusion of material through said plate;

a unit adjustably secured to said housing and mounting the blades for rotation along said cutting surface;

means for aligning the plane of rotation of the blades with said cutting surface comprising an adjustable ring arranged between the housing and said unit, said ring having a wedge-like cross section forming a locating surface complementary to a mating surface on one of said unit and said support; and

means for adjusting said ring relative to said support and said unit in directions generally parallel to said cutting surface thereby varying the angular relation of the support and the unit for aligning the plane of rotation of the blades with said cutting surface, said adjustment means comprising several set screws in registration with said ring and said support to permit manual regulation and adjustment thereof.

4,290,743

DIE FOR EXTRUDING A HONEYCOMB STRUCTURAL BODY AND A METHOD FOR MANUFACTURING THE SAME

Kazuo Suzuki, Inazawa, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 21, 1980, Ser. No. 132,626
Claims priority, application Japan, Nov. 20, 1979, 54/149439
Int. Cl.³ B29F *3/00*
U.S. Cl. 425—461 **16 Claims**

1. A die for extruding a honeycomb structural body composing of an integral metal block provided with

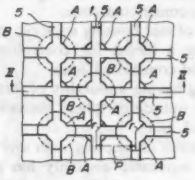
(a) one surface provided with a plurality of circular perforated holes A having a given depth and a given pattern and a grid-formed slits conforming to a cross-sectional shape of a extruded honeycomb structural body to be extruded and

(b) another surface provided with a plurality of perforated holes B having a given depth and a given pattern,

said slits connecting to the holes B, having a smaller width than a diameter of the holes A and passing through center of the holes A.

7. A method for manufacturing a die for extruding a honeycomb structural body, which comprises

(a) perforating a plurality of circular holes A having a given depth and a given pattern on one surface of an integral metal block,



(b) perforating a plurality of holes B having a given depth and a given pattern on another surface of said block and

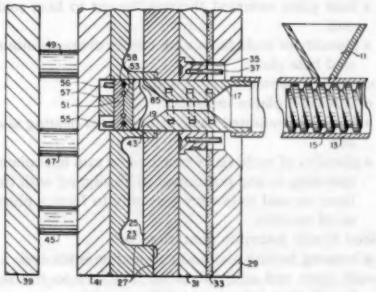
(c) providing a grid-formed slits conforming to a cross-sectional shape of a honeycomb structural body to be extruded and connecting to the holes B on the surface provided with the holes A, said slits having a smaller width than a diameter of the holes A and the slits which pass through the holes A, passing through center of the holes A.

4,290,744

APPARATUS FOR RUNNERLESS INJECTION-COMPRESSION MOLDING THERMOSETTING MATERIALS

W. Andrew Dannels, Grand Island, N.Y., and Robert W. Bainbridge, Gainesville, Ga., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 972,182, Dec. 21, 1978, abandoned. This application Feb. 5, 1980, Ser. No. 118,381
Int. Cl.³ B29F *1/08*; B29G *3/00*
U.S. Cl. 425—543 **11 Claims**



1. An improved injection-compression molding apparatus comprising:

a stationary assembly comprised of:

a stationary platen member,

a heat plate mounted thereon, means to heat said plate, and

a plurality of mold faces with runner channels mounted on said heat plate;

a moveable assembly comprised of:

a moveable platen member,

a heat plate mounted thereon, means for heating said plate, and

a plurality of mold faces mounted on said heat plate corresponding to and positioned to be aligned with the mold faces on said stationary assembly to form a plurality of mold cavities;

a feed nozzle assembly comprised of:

a housing having a closed end and an open end,

said open end adapted to be attached to the injection barrel of an injection molding machine,

said closed end and interior of said housing forming an internal chamber,

said internal chamber narrowing along a portion thereof to form a constricted zone,

the portion of said housing adjacent said constricted zone containing a means for controlling the temperature within said constricted zone,

said housing having a plurality of feed outlets positioned along the outside periphery thereof contiguous to said closed end, and

said feed outlets connecting with said internal chamber;

wherein said moveable assembly has a temperature-controlled area comprised of a temperature-controlled plate member that is in contact with and assists in cooling the closed end of said nozzle assembly when the moveable assembly is in contact with the stationary assembly;

means to move said moveable assembly to bring said moveable mold faces into close proximity and aligned with corresponding faces in said stationary assembly to form partially open mold cavities and runner channels connected to the exterior of the mold cavities,

means for feeding a supply of plasticized thermosetting molding material into the open end of said nozzle member, through said feed outlets, through said runner channels and into said partially open mold cavities,

means to seal off said runner channels to retain molding material in the mold cavities during the curing cycle,

means for closing said partially open mold cavities to compress and cure the thermosetting material enclosed within the mold cavities by pressure and heat, and

means for retracting said moveable assembly to separate said mold faces and remove a molded article.

4. An improved injection-compression molding apparatus comprising:

a stationary assembly comprised of:

a stationary platen member,

a heat plate mounted thereon, means to heat said plate, and

a plurality of mold faces with runner channels mounted on said heat plate;

a moveable assembly comprised of:

a moveable platen member,

a heat plate mounted thereon, means for heating said plate, and

a plurality of mold faces mounted on said heat plate corresponding to and positioned to be aligned with the mold faces on said stationary assembly to form a plurality of mold cavities;

a feed nozzle assembly comprised of:

a housing having a closed end and an open end,

said open end adapted to be attached to the injection barrel of an injection molding machine,

said closed end and interior of said housing forming an internal chamber,

said internal chamber narrowing along a portion thereof to form a constricted zone,

the portion of said housing adjacent said constricted zone containing a means for controlling the temperature within said constricted zone,

said housing having a plurality of feed outlets positioned along the outside periphery thereof contiguous to said closed end, and

said feed outlets connecting with said internal chamber;

wherein the stationary heat plate has a temperature-controlled sleeve member therein, positioned to surround the housing member of said nozzle assembly and separate said heat plate from said housing;

means to move said moveable assembly to bring said moveable mold faces into close proximity and aligned with corresponding faces in said stationary assembly to form partially open mold cavities and runner channels connected to the exterior of the mold cavities,

means for feeding a supply of plasticized thermosetting molding material into the open end of said nozzle member, through said feed outlets, through said runner channels and into said partially open mold cavities,

means to seal off said runner channels to retain molding material in the mold cavities during the curing cycle,

means for closing said partially open mold cavities to compress and cure the thermosetting material enclosed within the mold cavities by pressure and heat, and

means for retracting said moveable assembly to separate said mold faces and remove a molded article.

7. An improved injection-compression molding apparatus comprising:

a stationary assembly comprised of:

a stationary platen member,

a heat plate mounted thereon, means to heat said plate, and

a plurality of mold faces with runner channels mounted on said heat plate;

a moveable assembly comprised of:

a moveable platen member,

a heat plate mounted thereon, means for heating said plate, and

a plurality of mold faces mounted on said heat plate corresponding to and positioned to be aligned with the mold faces on said stationary assembly to form a plurality of mold cavities;

a feed nozzle assembly comprised of:

a housing having a closed end and an open end,

said open end adapted to be attached to the injection barrel of an injection molding machine,

said closed end and interior of said housing forming an internal chamber,

said internal chamber narrowing along a portion thereof to form a constricted zone,

the portion of said housing adjacent said constricted zone containing a means for controlling the temperature within said constricted zone,

said housing having a plurality of feed outlets positioned along the outside periphery thereof contiguous to said closed end,

said feed outlets connecting with said internal chamber; and

said feed nozzle assembly positioned such that feed outlets project beyond said stationary assembly;

means to move said moveable assembly to bring said moveable mold faces into close proximity and aligned with corresponding faces in said stationary assembly to form partially open mold cavities and runer channels connected to the exterior of the mold cavities, whereby said feed nozzle assembly is fixedly positioned with respect to said stationary assembly,

means for feeding a supply of plasticized thermosetting molding material into the open end of said nozzle member, through said feed outlets, through said runner channels and into said partially open mold cavities,

means to seal off said runner channels by movement of said moveable assembly with respect to said fixed nozzle assembly and said stationary assembly to retain molding material in the mold cavities during the curing cycle,

means for closing said partially open mold cavities to compress and cure the thermosetting material enclosed within the mold cavities by pressure and heat, and

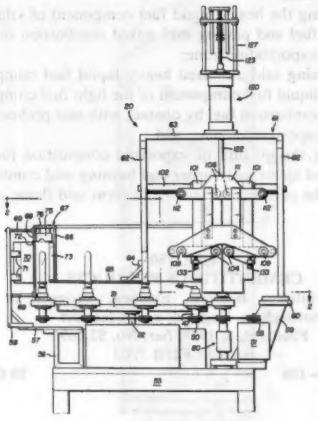
means for retracting said moveable assembly to separate said mold faces and remove a molded article.

4,290,745

APPARATUS FOR BLOW MOLDING

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 2,146, Jan. 9, 1979, Pat. No. 4,234,297, which is a division of Ser. No. 886,488, Mar. 14, 1978, Pat. No. 4,224,263. This application May 9, 1980, Ser. No. 148,477
Int. Cl.[3] B29C *17/07*
U.S. Cl. 425—541 2 Claims



1. A blow mold arrangement comprising

first and second blow mold sections, horizontally openable and closable relative to a vertical closing plane and cooperably defining an interior blow mold cavity,

means guiding said sections for linear horizontal movement toward and away from said plane,

first and second horizontal actuating yokes, positioned on opposite sides of said sections and each bridging said plane, each yoke having first and second ends,

two tie bars which are parallel to each other and to said plane, each interconnecting an end of said first yoke to an end of said second yoke and being spaced apart sufficiently to accommodate full opening of said sections,

each yoke having a first pivot pin near its first end and a second pivot pin near its second end, said first pin being connected by a link to a third pivot pin rigidly attached to said first mold half; said second pin being connected by another link to a fourth pivot pin rigidly attached to said second mold half, said first and second pins being farther apart than said third and fourth pins,

power means for (1) simultaneously raising said first and second yokes with the elevation of said first and second pivot pins pivoting the links to move said third and fourth pivot pins away from each other and thus outwardly from the mold closing plane, thereby opening the mold sections and (2) simultaneously lowering said yokes with the lowering of said first and second pivot pins pivoting the links to move said third and fourth pivot pins toward each other and thus inwardly toward the mold closing plane, thereby closing the mold sections, and

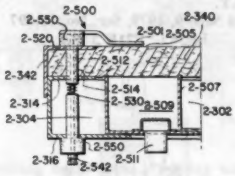
means for limiting the movement of said links to a position where the links on either side of the mold closing plane are precisely horizontally aligned in a dead center position to resist separation of the blow mold sections.

4,290,746

RADIANT HEATING

Thomas M. Smith, 114 Villinger Ave., P.O. Box C-94, Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 952,332, Oct. 18, 1978, and Ser. No. 775,838, Mar. 9, 1977, which is a continuation-in-part of Ser. No. 701,687, Jul. 1, 1976, abandoned, and Ser. No. 674,409, Apr. 7, 1976, Pat. No. 4,035,132. This application Mar. 13, 1979, Ser. No. 20,079
Int. Cl.[3] F23D *13/12*
U.S. Cl. 431—328 4 Claims



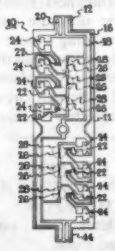
1. A gas-fired infra-red generator having a burner body defining a combustion mixture plenum that is encircled by a tubular air-seal plenum forming a shelf around the inside wall of the body, a ceramic fiber mat covering the plenum with the mat edges on the shelf, a series of lengths of hold-down angle extending around the periphery of the mat, and bolts engaging each length of hold-down angle and extending through the tubular plenum to the back of the burner body to clamp the angles to the back of the body and hold the mat in place.

4,290,747

PHOTOFLASH LAMP ARRAY CIRCUIT BOARD HAVING RADIATION SENSITIVE FUSE ELEMENTS

Edward J. Collins, Mentor-on-the-Lake, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 9, 1979, Ser. No. 92,696
Int. Cl.[3] F21K *5/00*
U.S. Cl. 431—359 13 Claims



1. In a circuit board for a photoflash array having a lamp firing circuit pattern deposited on a dielectric substrate and radiation sensitive switches connected in said circuitry for sequential firing of a plurality of flash lamps connected thereto, said circuit pattern comprising an organic resin matrix having particulated electrically conductive material dispersed therein and further including radiation sensitive fuse elements located at positions where the dielectric substrate has a reduced thickness relative to the remaining thickness of said dielectric substrate and with said fuse elements being formed by providing a more narrow width of said circuit pattern at the fuse locations than the remaining width of said circuit pattern, the improvement wherein said fuse elements are electrically connected together in a series circuit combination to increase the dielectric breakdown voltage of said combination upon successive actuation of the fuse elements, each of said flashlamps being

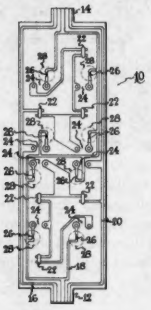
connected in branch circuits having a radiation sensitive switch connected between one side of each pair of successively connected flashlamps and a radiation sensitive fuse element connected between the remaining side of each pair of successively connected flashlamps.

4,290,748

PHOTOFLASH LAMP ARRAY CIRCUIT BOARD HAVING RADIATION SENSITIVE FUSE ELEMENTS

Edward J. Collins, Mentor-on-the-Lake, Ohio, and William A. Lenkner, Neoga, Ill., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 9, 1979, Ser. No. 92,697
Int. Cl.[3] F21K *5/00*
U.S. Cl. 431—359 **10 Claims**



1. In a circuit board for a photoflash lamp array having a lamp firing circuit pattern deposited on a dielectric substrate and radiation sensitive switches connected in said circuitry for sequential firing of a plurality of flash lamps connected thereto, the improvement wherein said circuit pattern comprises an organic resin matrix having particulated electrically conductive material and a radiation absorbing material dispersed therein, said circuit pattern further including radiation sensitive fuse elements located at positions where the dielectric substrate has a reduced thickness relative to the remaining thickness of said dielectric substrate and with said fuse elements being formed by providing a more narrow width of said circuit pattern at the fuse locations than the remaining width of said circuit pattern, each of said flashlamps and radiation fuse elements being connected in branch circuits having the radiation sensitive switches connected therebetween.

4,290,749

PERLITE EXPANSION PROCESS AND APPARATUS THEREFOR

Andre R. de Muinck, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 23, 1978, Ser. No. 953,376
Int. Cl.[3] F27B *14/00*
U.S. Cl. 432—13 **14 Claims**

1. In a process for the expansion of perlite in which perlite granules are expanded by rapid heating in a flame zone in an expansion chamber, said flame zone is created by the combustion of combustible fuel in the presence of air, said combustion is initiated by a burner, and said perlite after expansion is conveyed out of said expansion chamber entrained in the flow stream formed of excess air and combustion products, the improvement whereby said process may be operated on combustible fuel comprising light fuel, heavy liquid fuel or mixtures thereof alternatively, without change in the apparatus by which means the process is practiced, said improvement comprising:

(a) preheating the air for combustion in an enclosure adjacent to the outer wall of said expansion chamber, said preheating being accomplished by contacting the air with said outer wall of said expansion chamber and absorption by said air of heat emanating from said wall;

(b) providing a conduit for said preheated air from said enclosure to said burner;

(c) locating a mixing chamber in said conduit at a point ahead of said burner;

(d) passing said preheated air to said mixing zone;

(e) providing to said mixing zone a quantity of combustion fuel sufficient to burn in the presence of said preheated air in said expansion chamber to form said flame zone, the combustion fuel and preheated air being mixed in said mixing zone;

(f) atomizing the heavy liquid fuel component of said combustion fuel and passing said mixed combustion fuel and air to a vaporization zone;

(g) vaporizing said atomized heavy liquid fuel component and the liquid fuel component of the light fuel component of said combustion fuel by contact with said preheated air in said vaporization zone; and

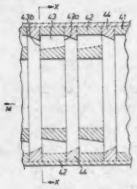
(h) passing the mixture of vaporized combustion fuel and preheated air to said burner and burning said combustion fuel in the presence of said air to form said flame zone.

4,290,750

CEMENTITIOUS PRODUCTS

Desmond Whiteley, Bedford, England, assignor to John Fletcher, Nottingham, England, a part interest

Filed Jul. 2, 1979, Ser. No. 53,769
Int. Cl.[3] F27B *7/02*
U.S. Cl. 432—106 **10 Claims**



1. A rotating kiln for the manufacture of cementitious material, said kiln comprising in combination:

(a) an elongated tubular member mounted for rotation about an axis inclined to the horizontal and having a lower end, the central cross-section of said tubular member being free from any fixed obstruction to the flow of gases through said tubular member;

(b) means for feeding a material into said tubular member;

(c) means for permitting the exit of material from adjacent to the lower end of said tubular member;

(d) at least one lifting device, each said lifting device including:

i. at least one ring, each said ring including a plurality of lifting members rigidly fixed to the interior periphery of said tubular member and extending radially inwardly of said tubular member for lifting material from adjacent to the bottom of said tubular member and for allowing the material to drop back to the bottom of said tubular member, each said lifting member including an inlet opening through which the material enters said lifting member, an outlet opening from which the material leaves said lifting member and a passageway for the material between said inlet and outlet openings; and

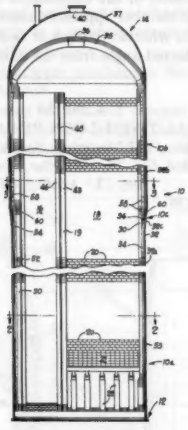
ii. banker rings disposed intermediate said rings for delaying passage of the material through said passageway of said lifting members in said rings said banker rings including means for restricting said outlet openings of said lifting members.

4,290,751

BLAST FURNACE STOVE

William H. Malone, Northfield; John Fischley, Chagrin Falls; Harry L. Anderson, Brecksville, and Edward J. Spirko, Broadview Heights, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 8, 1979, Ser. No. 92,447
Int. Cl.[3] C21B 9/00; F24H 7/00
U.S. Cl. 432—214 5 Claims



1. A blast furnace stove having a continuous peripheral wall of substantially circular cross section extending from a base to a domed cover, comprising:

(a) a lower section including:

(i) a refractory ring wall of a predetermined thickness;

(ii) a lower metal shell having a substantially uniform diameter surrounding said ring wall;

(iii) a layer of insulation intermediate the ring wall and the metal shell;

(b) an upper, diametrically larger, section disposed above the lower section including:

(i) a continuation of the refractory ring wall of the lower section;

(ii) a layer of insulating brick surrounding said ring wall in the upper section;

(iii) an upper metal shell having a substantially uniform diameter surrounding said insulating brick;

(iv) a layer of insulation intermediate the insulating brick and the upper metal shell;

(c) an annular interconnecting section intermediate the lower and upper sections including:

(i) a continuation of the refractory ring wall of the lower section;

(ii) vertically tapered insulating bricks surrounding said refractory ring wall;

(iii) a layer of insulation surrounding said tapered insulating bricks;

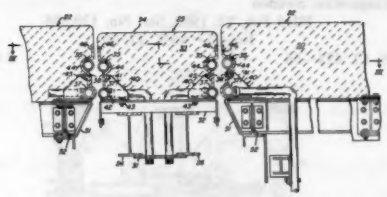
(iv) an annular interconnecting metal shell portion which obliquely joins the lower metal shell and upper metal shell to provide a gradual increasing diameter from the lower section to the upper section of the peripheral wall, said shell providing some vertical support for the tapered insulating bricks.

4,290,752

WALKING BEAM FURNACE

Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmont & Associates, Inc., McMurray, Pa.

Filed Aug. 4, 1980, Ser. No. 175,303
Int. Cl.[3] F27D 3/00; F27B 9/14
U.S. Cl. 432—235 11 Claims



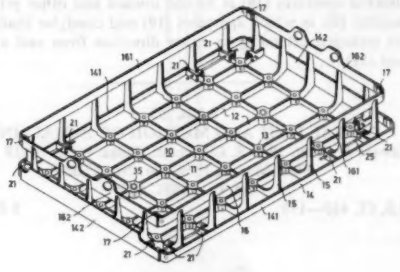
1. In a walking beam furnace having walls and a hearth forming a passageway for workpieces, said hearth including stationary and movable walking beam assemblies to support and advance the workpieces along the passageway, the combination wherein said walking beam assemblies include a body of refractory having a workpiece-engaging face, a support to carry said body of refractory, upper and lower runs of coolant pipes, means to join together said pipes to extend along each of the opposite lateral sides of said body of refractory below the workpiece-engaging face thereof, and clip means carried below the upper run of said coolant pipes while supported thereby to extend upwardly to a point spaced below the workpiece-engaging face of said body of refractory for cooling and lateral support thereof.

4,290,753

HEAT TREATING BASKET

Rudolf Klefisch, Siebengebirgsallee 165, D-5000 Kön 41, Fed. Rep. of Germany

Filed Feb. 4, 1980, Ser. No. 118,594
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904722
Int. Cl.[3] C21D 9/00; F27D 1/00
U.S. Cl. 432—261 9 Claims



1. A heat treating basket for transporting material which is being heat treated which comprises

a bottom grating containing elements thereof which extend into upwardly projecting struts which define the vertical walls of the basket;

an upper frame member connecting together the upper end portions of said struts;

a lower rim member for connecting together the lower portions of said struts,

coupling members provided near the lower corners of said basket for loosely connecting the lower rim member to the bottom grating, and

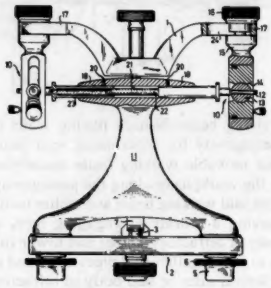
means for providing rigid connections between the lower rim member and the bottom grating, intermediate the coupling members.

4,290,754

ARTICULATOR FOR USE IN THE MAKING OF DENTURES OR PARTS THEREOF

Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

Filed Feb. 12, 1980, Ser. No. 120,886
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—56 **5 Claims**



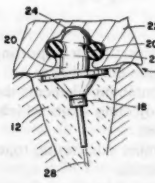
1. In an articulator for use in making dentures or parts thereof, which comprises two principal members **(1,2)**, provided with anchoring means **(3)** for carrying models of the upper and lower rows of teeth, said members **(1,2)** being pivotable in relation to each other by means of two condylar mechanisms **(10)**, which simulate the movements of the jaw joint, and one of said members **(2)** supporting the other **(1)**, for which purpose said one member **(2)** has a single slender arm or post **(11)**; the improvement in which said arm or post **(11)** at its end toward the other principal member **(1)** carries condylar shafts **(12)**, that are included in said condylar mechanisms **(10)**, condylar balls **(13)** which are displacable on said shafts **(12)**, the other said member **(1)** carrying condylar tracks **(14)**, and said single arm or post **(11)** having two collinear but oppositely directed apertures **(19)** at its end toward said other principal member **(1)**, in which apertures **(19)** said condylar shafts **(12)** are arranged extending in either direction from said arm or post **(11)**.

4,290,755

DENTAL POST AND METHOD OF INSTALLING

Edward S. Scott, 1818 S. Cincinnati, Tulsa, Okla. 74119

Filed Mar. 5, 1979, Ser. No. 17,350
Int. Cl.³ A61C *8/00*
U.S. Cl. 433—173 **5 Claims**



1. A dental post for removably securing a denture to the root of a tooth having a root canal, the tooth having a hole drilled therein following the root canal, the denture apparatus having therein a recess defined in part by an elastomeric member having an opening therethrough, the dental post comprising:

a body having an intermediate enlarged diameter circular portion and having an integral first symmetrical stem circular in all cross sectioned taken perpendicular the stem axis, the first stem being dimensioned for permanent attachment in a drilled hole formed in the root of a tooth; and

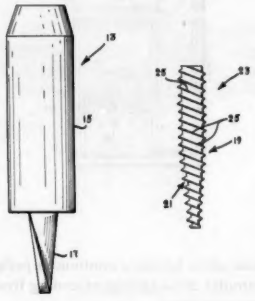
a second integral stem portion extending from said body in the direction opposite said first stem, the second stem having an enlarged outer head portion dimensioned to be received through a denture apparatus elastomeric member by compression of the elastomeric member whereby the elastomeric member applies retentative force to the head portion, and wherein the axis of said second stem is offset by a preselected angle from the axis of said first stem.

4,290,756

DENTAL TWIST-LOCK PIN AND DRILL

Wm. Ralph Sellers, 717 Moorside, San Antonio, Tex. 78239

Filed Jun. 22, 1979, Ser. No. 51,317
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—225 **2 Claims**



1. In combination, a tapered drill for drilling a tapered hole into sound tooth structure and a twist-lock pin for insertion into the hole drilled by the tapered drill, said twist-lock pin having a left hand thread on the outer surface thereof, said twist-lock pin having a tapered lower portion and a straight threaded upper portion for threadable engagement with a suitable insertion wrench, the tapered lower portion of said twist-lock pin being dimensioned to be fully insertable into the tapered hole in the tooth without threading for engagement with the entire tapered surface of the drilled hole in the tooth, the twist-lock pin being positively held in the wrench and inserted into the tapered drilled hole and rotated counterclockwise less than one revolution thereby causing the pin to be fully seated in the tooth.

4,290,757

BURST ON TARGET SIMULATION DEVICE FOR TRAINING WITH ROCKETS

Albert H. Marshall, Orlando, and Herbert C. Towle, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1980, Ser. No. 157,750
Int. Cl.³ F41G *3/26*; F41J *5/02*
U.S. Cl. 434—12 **22 Claims**

1. A burst on target simulator device for training with rockets, comprising in combination:

first broadcasting means having an input for projecting visual information along a first light path;

second broadcasting means for projecting target information along a second light path, said target information includ-

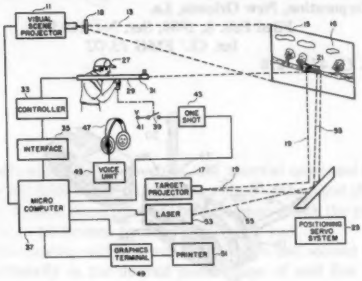
ing a visual target and an infrared target spot in alignment with said visual target;

a reflective display screen spatially disposed downstream from said first broadcasting means adapted for receiving the visual information projected along said first light path so as to form thereon a background scene, and the target information projected along said second light path so as to form thereon said visual target and said infrared target spot in alignment therewith;

positioning means located between said second broadcasting means and said reflective display screen, and having an input for redirecting the target information projected along said second light path in a predetermined manner so as to move said visual target and the infrared target spot in alignment therewith in a predetermined direction upon said reflective display screen;

a weapon having a trigger mechanism for effecting the simulated firing thereof;

sensing means mounted within said weapon and having a data output for continuously sensing the position of said infrared target spot upon said reflective display screen,



and for continuously providing at the output thereof digital data bits indicative of the position of said infrared target spot upon said reflective display screen; and

computing means having a data input connected to the data output of said sensing means, trigger input connected to the output of the trigger mechanism of said weapon, a first output connected to the input of said positioning means, a second output connected to the input of said first broadcasting means, a third output, a fourth output, and a fifth output for extracting from said sensing means the digital data bits provided thereby only when a marksman activates the trigger mechanism of said weapon, for processing the digital data bits extracted from said sensing means so as to determine the extract position of said infrared target spot only when said marksman activates the trigger mechanism of said weapon, for providing indicator signals indicative of whether said marksman has scored a hit, miss, or near miss upon said visual target, and for providing a position control signal so as to activate said positioning means and thereby control the movement of said visual target, and the infrared target spot in alignment therewith upon said reflective display screen.

4,290,758

TRAINING AID

Rohn Lee Lucero, P.O. Box 1794, Tuba City, Ariz. 86045

Filed Sep. 13, 1979, Ser. No. 75,213
Int. Cl.³ G09B *13/00*
U.S. Cl. 434—227 **6 Claims**

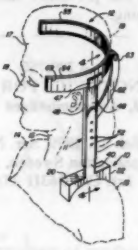
1. A training aid for engaging the shoulder of a student and for turning the head of the student in a predetermined direction relative to the shoulder of the student, said training aid comprising:

a. a shoulder engaging member for receiving and bearing only upon one shoulder of said student, said shoulder engaging member having a longitudinal axis;

b. a generally U-shaped head engaging member for receiving the back of the head, said head engaging member having an axis of symmetry;

c. an elongate substantially upright support member having,

i. a lower portion immovably affixed to said shoulder engaging member, and



ii. an upper portion supporting said head engaging member above the ears of said head; and

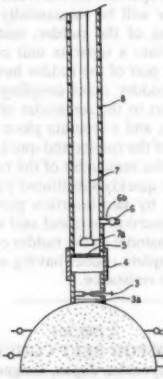
d. bracket means for securing the head engaging member to the upper portion of the upright support member so that the axis of symmetry of the head engaging member is at an angle oc with respect to the longitudinal axis of the shoulder engaging member.

4,290,759

APPARATUS FOR TEACHING PRESSURE CONTROL IN OIL AND GAS DRILLING OPERATIONS

Ed. O. Seabourn, Hinna, Norway; Lewis W. Patterson, and Richard G. Stiverson, both of Lafayette, La., assignors to Saga Petroleum A.S. & Co., Stavanger, Norway

Filed Nov. 7, 1979, Ser. No. 68,332
Claims priority, application Norway, Aug. 23, 1978, 782860
Int. Cl.³ G09B *25/00*
U.S. Cl. 434—370 **9 Claims**



1. An apparatus for teaching pressure control in drilling for oil and gas, comprising

a complete miniature drilling rig,

a drilling pipe connected at one end thereof with said drilling rig,

a drilling bit connected with the other end of said drilling pipe,

a casing and a reservoir,

said reservoir including a container filled with particulate

material and being provided with means for controlling the supply of pressurized gas,

said casing including a transparent tube communicating with said reservoir through a screen,

a plug replaceably located in the lower part of said casing and adapted to be penetrated by said drilling bit when said drilling pipe is lowered from said miniature drilling rig, whereby the gas pressure in said reservoir is transmitted to said casing, and

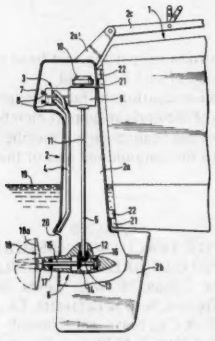
a miniature blow out preventer stack located in the upper part of said casing.

4,290,760

MANEUVERING DEVICE FOR SAILING BOATS

Karl-Erick Lindblad, Annelundsvägen 22, S-441 00 Alingsas, Sweden

Filed Jul. 27, 1979, Ser. No. 61,176
Claims priority, application Sweden, Aug. 8, 1978, 7808462
Int. Cl.³ B63H *25/06*
U.S. Cl. 440—51 **4 Claims**



1. Maneuvering device for sailing boats comprising a rudder, and propulsion means comprising a propeller unit and driving means therefore incorporated in the rudder so that the propulsion effect of said propulsion means relative to the water surrounding the rudder will be substantially directed along the vertical center plane of the rudder, said propulsion means being incorporated into a separate unit comprising a readily detachable insertion part of the rudder having a shape following the form of the rudder, quick coupling means for connecting said insertion part to the remainder of the rudder and for the removal of same, and a separate piece also having a shape following the form of the rudder and quick coupling means for connecting same to the remainder of the rudder, whereby said insertion part can be quickly substituted by said separate piece to fill the space left by said insertion part when the latter is removed, and said insertion part and said separate piece when connected to the remainder of the rudder cooperating with the latter to make a complete rudder having smooth side surfaces and a very low flow resistance.

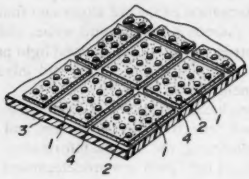
4,290,761

LAGGING BODY FOR BELT CONVEYOR PULLEY

Mutsuo Suginaka, Toyonaka, Japan, assignor to Nippon Tsusho Company Limited, Hiroshima, Japan

Filed Jun. 14, 1979, Ser. No. 48,567
Claims priority, application Japan, Dec. 26, 1978, 53/176675[U]; Jan. 8, 1979, 54/222; Apr. 11, 1979, 54/43839
Int. Cl.³ F16H *55/48*; B65G *23/12*
U.S. Cl. 474—190 **33 Claims**

1. A lagging body available for a belt conveyor pulley, comprising, a rubber substrate, a number of small plate-like ceramic lagging elements aligned in the lateral and longitudinal directions and secured on the surface of said rubber substrate, wherein said lagging element consists of 80–90% by weight of ceramic particles added with 20–10% by weight of an inorganic bonding agent selected from silica, sodium silicate and glaze of glassy material.

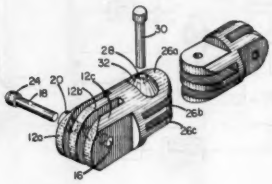


4,290,762

MULTIPLE LINK TRANSMISSION CHAIN

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Feb. 8, 1980, Ser. No. 119,986
Int. Cl.³ F16G *13/02*
U.S. Cl. 474—210 **8 Claims**



1. A multiple link chain composed of a plurality of identical links, each comprising:

a link body having a longitudinal axis and first and second link ends spaced along the axis, each identical to the other and each angularly disposed with respect to the other about the axis by 90 degrees;

each link end having a plurality of spaced members extending along the axis;

an opening in each of said members aligned along an axis orthogonal to the longitudinal axis, the orthogonal axis of one link end being orthogonal to the axis of the other link end; 'said aligned openings through said members accepting a pivot pin;

a protrusion at each link end and each outwardly extending from the outer one of the associated spaced members, each symmetrically disposed about the associated orthogonal axis and adapted for driving engagement with a sprocket wheel; and

each of said link ends being mateable to either link end of adjacent links by interdigitated connection of the spaced members of the adjacent links.

4,290,763

METHOD FOR PRODUCING ENCLOSED MULTIPANELED ENVELOPES

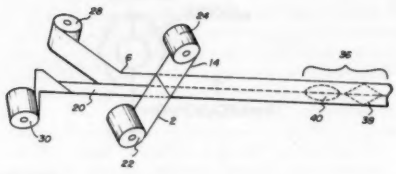
Gerald L. Hurst, 1401 Spring Garden, Austin, Tex. 78746

Filed Jun. 15, 1979, Ser. No. 48,787
Int. Cl.³ B31D *5/00*
U.S. Cl. 493—341 **11 Claims**

1. A method for producing an enclosed, multipaneled envelope suitable for inflation with a lighter than air gas to form a buoyant balloon from webs of nonelastomeric material which are sealable on one side only comprising the steps of:

(a) positioning a first web of said material of sufficient surface area to form a desired panel shape;

(b) positioning at least one folded web member of said material over said first web such that the edges of the panel shape to be formed therefrom will be coextensive with an edge of the panel shape to be formed from said first web, said folded web comprising at least one fold line along the line of symmetry of the panel shape to be formed therefrom;



(c) positioning a second web of said material over said first web and folded web such that the edges of the panel shape to be formed therefrom will be coextensive with the panel shape to be formed from said first web; and

(d) platen sealing said first web, folded web, and second web peripherally in the desired panel shape of said first and second webs;

the panels of the resulting envelope having substantially the same circumferential measurement after inflation as before.

4,290,764

METHOD AND APPARATUS FOR FOLDING A CARDBOARD SHEET ALONG A STRAIGHT FOLD LINE

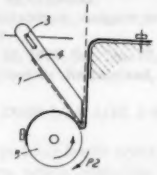
Jan Middel, Ijmuiden, Netherlands, assignor to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Jun. 15, 1979, Ser. No. 49,039

Claims priority, application Netherlands, Jun. 21, 1978, 7806683

Int. Cl.³ B65H *45/00, 45/14*

U.S. Cl. 493—395 **9 Claims**



1. Method of folding a sheet of cardboard along a straight fold line, comprising the steps of

(a) locating a first surface of said sheet, having a given dimension, against a first element having a straight edge of at least equal dimension to that of said sheet dimension which defines the fold line,

(b) locating an opposite surface of said sheet against a support surface having a dimension at least equal to said sheet dimension in the form of a tensioned flexible web which makes high-friction engagement with the cardboard sheet, and

(c) moving a second element having a dimension at least equal to said sheet dimension relative to said first element in a curved path about said straight edge so as to simultaneously engage and force said flexible web and said cardboard sheet adjacent the said edge of the first element to bend same around said edge, thereby folding the sheet and the web around the said edge to form the fold line in the sheet.

4,290,765

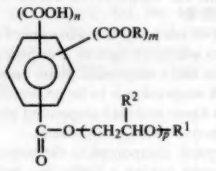
POLYOXYALKYLENE POLYCARBOXYLATE ESTERS AND A METHOD OF TREATING POLYESTER FABRIC

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 14, 1978, Ser. No. 969,594
Int. Cl.[3] D06B *1/00*
U.S. Cl. 8—115.6 4 Claims

1. A method of treating polyester fabric to give the fabric a durable, soil resistancy and water wicking properties comprising

(a) wetting a polyester fabric with a composition containing a compound having the formula:



wherein

(1) the ring can have all positional isomer arrangements;

(2) R is selected from the group consisting of

(3) R^1 and R^2 are independently selected from the group consisting of hydrogen and $—CH_3$;

(4) n and m are independently selected from an integer of 0 to 3;

(5) p is an integer of 6 to 23; and

(6) q is an integer of 3 to 11;

(b) drying the polyester fabric until the fabric is dry to the touch; and

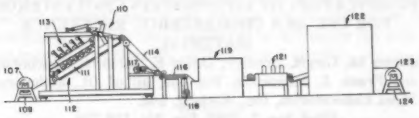
(c) curing the dried fabric in a temperature range of 190° to 200° C. for about 45 to 90 seconds.

4,290,766

CHEMICALLY SCULPTURING ACRYLIC FABRICS AND PROCESS FOR PREPARING SAME

Alonzo M. Burns, Jr., Inman; Jeffrey E. Silliman, Spartanburg; Woodrow P. Gilbert, Spartanburg, and William M. Pascoe, Sr., Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 22, 1980, Ser. No. 189,460
Int. Cl.[3] D06Q *1/02;* D06P *5/00;* D06M *3/16*
U.S. Cl. 8—491 15 Claims



1. In a process for sculpturing a pile fabric comprising at least about 80 percent by weight acrylic pile fibers with a jet dyeing apparatus including conveying means for transporting the textile, jet orifices for delivering a sculpturing composition to selected area of said pile fabric, said sculpturing composition containing at least one lower alkylene carbonate in a concentration sufficient to partially solvate the fibers of the pile in the selected areas, and control means for supplying data to control the operation of the application of the sculpturing composition by means of the jet dyeing apparatus by applying an aqueous admixture to the pile fabric in an amount sufficient to saturate the pile fabric, applying the sculpturing composition to the areas of the textile fabric to be provided with a sculptured effect, and recovering a resulting sculptured textile fabric, the improvement comprising incorporating E-caprolactam into the sculpturing composition in an amount of at least about 3 weight percent.

4,290,767

PROCESS FOR SLOP-PADDING TEXTILE CELLULOSE MATERIAL

Heinz Abel, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,422
Claims priority, application Switzerland, Sep. 29, 1978, 10195/78
Int. Cl.[3] D06P *1/56, 1/38, 3/66*
U.S. Cl. 8—496 27 Claims

1. A process for slop-padding textile cellulose material with anionic substantive dyes, which comprises applying to said material an aqueous dye liquor which, in addition to the dye, contains

(a) a quaternisation product of a poly adduct

(a_1) of 2 to 100 moles of alkylene oxide with 1 mole of a fatty amine containing at least 8 carbon atoms, or

(a_2) of 2 to 100 moles of alkylene oxide and 1 mole of styrene oxide with 1 mole of a fatty amine containing at least 8 carbon atoms,

(b) 2.5 to 15 g/l an etherified N-methylolmelamine, and

(c) an acid catalyst,

and then subjecting the textile material to a heat treatment.

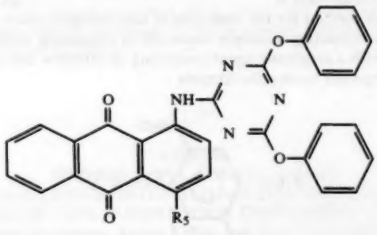
4,290,768

PROCESS FOR DYEING AND PRINTING CELLULOSE FIBRES

Rütger Neeff, Leverkusen; Robert Kuth, Cologne; Werner Kühnel, and Wilhelm Gohrbandt, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 7, 1980, Ser. No. 110,033
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903132
Int. Cl.[3] D06P *3/852, 1/24;* C09B *1/26*
U.S. Cl. 8—532 1 Claim

1. Process for dyeing and printing cellulose fibres, or fibre mixtures containing cellulose fibres, which have been swollen with water-miscible swelling agents capable of maintaining the fibres in swollen condition after removal of water and boiling above 150° C., characterized in that the fibres are treated with a dyestuff of the general formula



wherein

R_5 is hydrogen, a hydroxyl or cyclohexyl group or a phenylamino or benzoylamino group, which can be substituted in the phenyl ring by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

and the dyestuff is fixed by means of a heat treatment.

4,290,769
STABILIZED ROMANOWSKY STAIN SOLUTION

John C. Liao; Chittaranjan P. Patel, both of Elkhart, and John L. Ponzo, Mishawaka, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 14, 1980, Ser. No. 196,365
Int. Cl.[3] C09B 67/00
U.S. Cl. 8—602 11 Claims

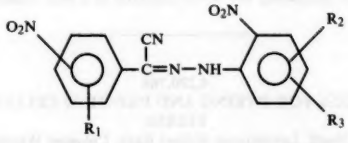
1. In combination with a Romanowsky type stain comprising azures, Methylene Blue and an eosin dye in methanol solution, the improvement which comprises the presence of a stabilizing amount of an ammonium halide, a primary, secondary or tertiary alkylamine hydrohalide or a combination thereof in which the alkyl chains contain from 1 to 6 carbon atoms, said halide being selected from the group of chloride, bromide or iodide.

4,290,770
PROCESS FOR THE COLORATION OF HYDROPHOBIC FIBERS

Manfred C. Rau, La Campagne, France, assignor to P C U K Produits Chimiques Ugine Kuhlmann, Tour Manhattan-Courbevoie, France

Filed Dec. 31, 1979, Ser. No. 108,757
Claims priority, application France, Jan. 19, 1979, 79 01329
Int. Cl.[3] C09B 55/00
U.S. Cl. 8—662 11 Claims

1. Process for the coloration of hydrophobic fibers in which the disperse dyestuff used is a compound of the formula:



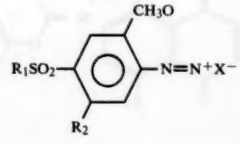
in which R_1 represents hydrogen or nitro, R_2 represents hydrogen, halogen, nitro, trifluoromethyl, alkyl or alkoxy, and R_3 represents hydrogen, halogen or cyano.

4,290,771
DIAGNOSTIC AGENT FOR THE DETECTION OF UROBILINOGEN

Wolfgang Hirsch, Wunstorf, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Sep. 12, 1979, Ser. No. 74,748
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1978, 2839931
Int. Cl.[3] G01N 33/72
U.S. Cl. 23—230 B 4 Claims

1. A method for the detection of urobilinogen which comprises contacting a sample suspected of containing urobilinogen with a diagnostic agent containing an effective amount of a compound having the formula



wherein

R_1 is selected from the group of radicals consisting of CH_3—, C_2H_5—, CH_2=CH—, HOC_2H_5— and $CH_3OC_2H_5$—,

R_2 is hydrogen or a (C_1–C_4)-radical, and X^- is a stabilizing anion.

4,290,772
REDUCING LIGHT SCATTER IN PHOTOMETRIC MEASUREMENTS INVOLVING SUSPENDED PARTICLES

Raymond Frey, Zurich, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed Oct. 1, 1979, Ser. No. 80,188
Claims priority, application Switzerland, Nov. 1, 1978, 11239/78
Int. Cl.[3] G01N 33/72, 21/15, 21/47
U.S. Cl. 23—230 B 5 Claims

1. A method of reducing disturbances of photometric measurement due to scattered light in a suspension consisting of a suspension agent and a suspended phase comprising suspended particles, which suspension is to be photometrically measured, said suspension agent and said suspended phase each having a respective refractive index, comprising:

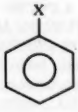
adding a chemical component to the suspension, said chemical component having a refractive index outside of the range encompassed by the refractive index of the suspension agent and the mean refractive index of the suspended phase and in a quantity effective to reduce such range.

4,290,773
STABILIZATION OF BENZIDINE-TYPE INDICATORS WITH VARIOUS ENHANCERS

Thomas A. Magers, South Bend, and David L. Tabb, Elkhart, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 13, 1979, Ser. No. 93,431
Int. Cl.[3] G01N 33/52
U.S. Cl. 23—230 B 5 Claims

1. In a composition for detecting the presence of a constituent in a test sample, said composition comprising a benzidine-type indicator, the improvement wherein said composition additionally comprises an enhancer compound have the structure



wherein X is OH, CN, NO_2, CHO, SO_3R' or NRCOR'; R is lower alkyl; and R' is H or lower alkyl.

4,290,774
PURIFICATION OF LIPOPROTEIN CHOLESTEROL FOR USE AS A CHOLESTEROL REFERENCE MATERIAL

Makram M. Girgis, Bradley; David E. Jackson, Bourbonnais, and Frank J. Mannuzza, Peotone, all of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 7, 1980, Ser. No. 110,228
Int. Cl.[3] G01N 33/68, 33/92, 33/96
U.S. Cl. 23—230 B 11 Claims

1. In a method for purifying lipoprotein cholesterol which involves the steps of adsorbing a solution of a lipoprotein-containing substance onto a silica adsorbant, separating the adsorbed lipoprotein from any excess solution present, freezing and thawing the adsorbed lipoprotein, eluting the adsorbed lipoprotein, concentrating the lipoprotein to a desired concentration and recovering purified lipoprotein cholesterol therefrom, the improvement comprising the steps of eluting the adsorbed lipoprotein at a pH from about 10 to 11.5, adjusting the salt concentration to about less than 0.05 M, heating the

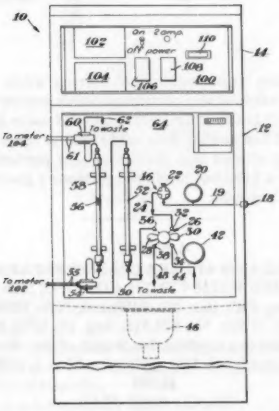
eluted lipoprotein to a temperature of from about 50° to 100° C. for a period of time sufficient to increase the storage stability of the purified lipoprotein cholesterol, adding an alkaline carbonate and an alkaline earth salt; adjusting the pH from about 6.5 to 9.0; and recovering therefrom said lipoprotein cholesterol.

4,290,775

ANALYTICAL METHOD FOR DETERMINING ACID/SALT AND BASE/SALT SPECIES CONCENTRATION IN SOLUTION

Timothy S. Stevens, and Theodore E. Miller, Jr., both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Filed Jan. 28, 1980, Ser. No. 115,837
The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.
Int. Cl.³ G01N *31/04, 27/08*
U.S. Cl. 23—230 R **18 Claims**



1. A flow injection method for determining acid or base species concentration in the presence of salt, comprising the steps of injecting sample into an aqueous carrier, analyzing the sample in carrier and storing the resulting signal thereby generated, said signal being proportionate to the acid/salt or base/salt concentration of the sample, eluting the sample in carrier through an ion-exchanger effective to derivatize the acid or base species to water or absorb the acid species, and to derivatize the salt in whole or in part to a soluble hydroxide derivative or soluble hydrogen derivative, respectively, said elution step being carried out for acids in a basic ion-exchanger in the hydroxide ion form and/or free amine form and for bases in an acidic ion-exchanger in the hydrogen ion form, analyzing the effluent of the ion-exchanger to obtain a calibrated signal which is proportionate to the original salt concentration, and establishing the difference in signals to determine the acid or base species concentration in the original sample.

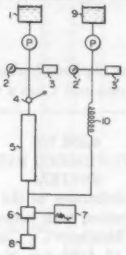
4,290,776

METHOD FOR ANALYZING ACIDIC SUBSTANCES BY HIGH SPEED LIQUID CHROMATOGRAPHY

Tsuyoshi Yamada, Yokohama, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 98,812, Nov. 30, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,647
Claims priority, application Japan, Dec. 6, 1978, 53/149917
Int. Cl.³ B01D *15/08*
U.S. Cl. 23—230 R **4 Claims**

1. An improvement in a process for analyzing acidic substances by high speed liquid chromatography which comprises incorporating an aqueous pH indicator solution in an effluent from a column packed with a packing material, and monitoring the pH indicator-incorporated effluent by means of spectrophotometry; the improvement comprising using as the pH indicator a sulphonphthalein indicator which is at least slightly soluble in water and has a pH transformation range falling within the pH range of from about 3.0 to about 10.0 and which



exhibits, when maintained at a pH lower than the pH transformation range, a minimum transmittance at a wave length of about 420–440 nm and, when maintained at a pH higher than the pH transformation range, a minimum transmittance at a wave length of at least about 558 nm.

4,290,777

REGENERATION OF FERRIC IONS IN COAL DESULFURIZATION PROCESS

Edward L. Czenkusch, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Dec. 21, 1979, Ser. No. 106,344
Int. Cl.³ C10L *9/02*
U.S. Cl. 44—1 SR **23 Claims**

1. A process for treating coal which comprises:
contacting the coal with an aqueous desulfurization reagent containing ferric ions and producing a reaction slurry comprising ferric ions, ferrous ions and hydrogen ions;
maintaining the hydrogen ion concentration of the reaction slurry at a level which inhibits precipitation of iron solids.

12. A process for treating coal which comprises:
contacting coal containing at least one naturally-occurring base with an aqueous desulfurization reagent containing ferric ions and producing a reaction slurry comprising ferric ions, ferrous ions and hydrogen ions;
regenerating ferric ions by oxidation of the ferrous ions;
maintaining the hydrogen ion concentration of the reaction slurry at a level which inhibits precipitation of iron solids during the regenerating step.

13. The process of claim 12 in which the hydrogen ion concentration is maintained by the controlled addition of acid to the reaction slurry.

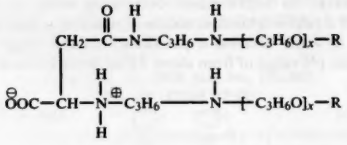
4,290,778

HYDROCARBYL ALKOXY AMINO ALKYLENE-SUBSTITUTED ASPARAGINE AND A MOTOR FUEL COMPOSITION CONTAINING SAME

Sheldon Herbstman, Spring Valley, and Peter Dorn, LaGrangeville, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1980, Ser. No. 204,414
Int. Cl.³ C10L *1/18, 1/22*
U.S. Cl. 44—71 **13 Claims**

1. The compound represented by the formula:



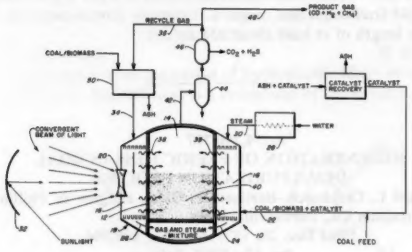
in which R represents an aliphatic hydrocarbon radical having from 8 to 24 carbon atoms and x has a value from 1 to 10.

4,290,779

SOLAR HEATED FLUIDIZED BED GASIFICATION SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Shaik A. Qader, 704 Marlboro Ct. Claremont, Calif., 91711

Filed May 15, 1980, Ser. No. 150,115
Int. Cl.[3] C10B *1/00*
U.S. Cl. 48—89 **7 Claims**



1. A solar heated gasifier apparatus comprising:
a reactor defining a reaction zone;
means associated with a first end of said reactor for introducing a fluidizing gas into said reactor;
means for introducing a particulate material into said reactor where it is maintained in a fluidized state;
means for introducing gaseous reactant into said reactor where said gaseous reactant reacts with said material to form gaseous product;
an annular solar heat absorber positioned for directly and uniformly heating the reactor and including a gas permeable high heat capacity solid for heating said fluidizing gas and said gaseous reactant prior to the introduction of said fluidizing gas and said gaseous reactant into the reactor;
means for introducing solar heat into said solar heat absorber; and
means associated with a second end of said reactor for removing said gaseous product from the reactor.

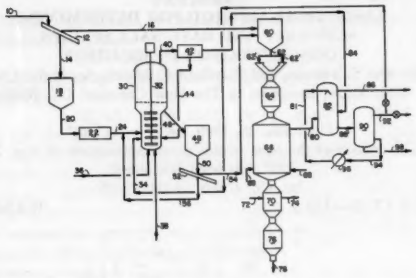
4,290,780

METHOD FOR GASIFYING FINELY-DIVIDED COAL IN A FIXED BED GASIFIER

Philip J. Dudt, Scenery Hill, Pa., assignor to Conoco Inc., Stamford, Conn.

Filed Nov. 16, 1979, Ser. No. 95,764
Int. Cl.[3] C10J *3/00*
U.S. Cl. 48—210 **7 Claims**

1. A process for gasifying finely-divided coal in a fixed bed gasifier, said process comprising
(a) charging said finely-divided coal to a stirred semi-fluidized carbonizer reaction zone;
(b) charging a free oxygen containing gas to said reaction zone in an amount sufficient to maintain a temperature in said reaction zone from about 950° to about 1200° F.;
(c) charging an inert sweep gas to said reaction zone at a rate sufficient to provide a linear gas velocity in said reaction zone from about 0.1 to about 0.5 feet per second;
(d) recovering a gaseous stream from said reaction zone;



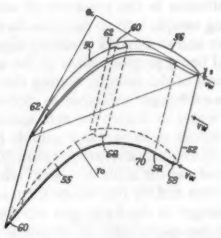
(e) recovering a particulate coal derived solids stream, at least a portion of said particulate solids stream being of a size consist greater than about ¼ inch for use as a feedstock to a fixed bed gasifier from said reaction zone; and
(f) charging at least said portion of said particulate solids stream to a fixed bed gasifier to produce a gaseous stream and an ash stream.

4,290,781

METHODS AND APPARATUS FOR SEPARATING GASES WITH VENTILATED BLADES

Chia-Gee Wang, P.O. Box 211, Millwood, N.Y. 10546

Continuation of Ser. No. 824,515, Aug. 15, 1977, Pat. No. 4,193,775, which is a continuation-in-part of Ser. No. 708,939, Jul. 22, 1976, abandoned. This application Mar. 2, 1979, Ser. No. 16,905
Int. Cl.[3] B01D *59/20*
U.S. Cl. 55—17 **22 Claims**



1. A method for separating an initial gas mixture of different molecular weight gas molecules on the basis of molecular weight of the different components of the mixture, comprising the steps of
introducing the gas mixture to be separated into a separation zone, rotatably moving at least one curved hydrodynamically smooth porous surface in said separation zone with a relative velocity v_w with respect to said gas mixture under non-turbulent conditions to provide a thin laminar boundary layer of said gas mixture adjacent said hydrodynamically smooth porous surface having a boundary layer displacement thickness δ_1, to provide an acceleration field having a strength of at least about 1×10^5 g immediately adjacent said thin laminar boundary layer, passing heavier molecular weight gas components through said thin laminar boundary layer with a differential sedimentation velocity of different molecular weight components through

said thin laminar boundary layer which is largest for the highest molecular weight gas component, such that the highest molecular weight gas component is preferentially concentrated at said hydrodynamically smooth porous surface, and

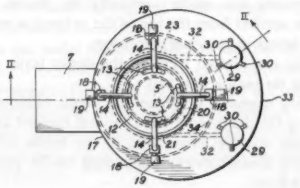
conducting gas from immediately adjacent said hydrodynamically smooth porous surface which is preferentially concentrated in the highest molecular weight gas component through said porous surface to produce a separated higher molecular weight gas fraction which is enriched in said heaviest molecular weight gas component with respect to the composition of said initial gas mixture.

4,290,782

GAS SCRUBBER AND METHOD

Richard D. Johnson, 29 W. Ash St., Lombard, Ill. 60148

Filed Oct. 25, 1979, Ser. No. 88,170
Int. Cl.³ B01D *53/10*
U.S. Cl. 55—60 **9 Claims**



1. A method of scrubbing and accelerating the draft of flue gases, comprising:

leading flue gases through a flue from a source to a discharge end of the flue;

diverting the flue gases from said discharge end of the flue into the top of a vertical passage extending a substantial length downwardly;

producing a substantially uniform shower of gas-scrubbing at least predominately solid particulate material dispersed in the top of said passage in sufficient solid particulate material volume and individual solid particulate material particle mass to gravitate downwardly in the passage at accelerating speed and thereby effecting not only scrubbing contact of the solid particulate material with the flue gases but also causing a downdraft of the flue gases in the passage and thereby accelerating drawing of flue gases from said discharge end of the flue into said passage and improving flue draft;

and at the lower end of said passage separating the scrubbed gases from the particulate material.

4,290,783

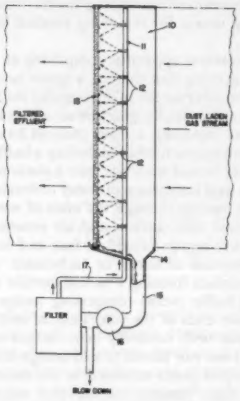
PROCESS FOR REMOVAL OF WATER SOLUBLE PARTICULATE MATERIAL FROM GAS STREAMS

Harry A. Adams, Bedford Heights, and William O. Fitzgibbons, Hudson, both of Ohio, assignors to Standard Oil Company (Sohio)

Filed Oct. 10, 1975, Ser. No. 622,181
Int. Cl.³ B01D *47/06*
U.S. Cl. 55—89 **12 Claims**

1. A process for the removal of urea particles entrained in an air stream by (1) contacting the particle-laden air stream with a continuous water spray partially wetting the urea particles, (2) passing the air stream containing partially wetted urea particles through a mist eliminator consisting of fiber compositions having an open area volume greater than 60 percent based on the total volume of the mist eliminator with sufficient velocity to cause impaction of some of the urea particles on the surface thereof, and (3) continuously removing the impacted urea particles from the surface of the mist eliminator by means of the continuous water spray directed towards its incoming surface.

9. Process for removing particulate material from a dust-laden gas exhausting from the top of a prilling tower, which comprises passing the dust laden gas through an aqueous scrub-



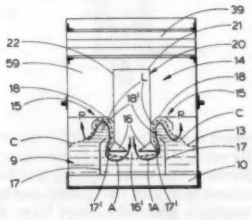
bing liquid spray and thence through a filter while simultaneously directing the scrubbing liquid spray against the filter in the same direction as the flow of gas for maintaining the filter in a continuously wetted and irrigated state, and passing cleaned gas from the downstream side of the filter out of the top of the tower.

4,290,784

APPARATUS AND METHOD FOR EXTRACTING DUST FROM AIR

Bogdan J. Rawicki, 17, Stanwick Rd., London W14 8TZ, England

Continuation of Ser. No. 964,195, Nov. 28, 1978, abandoned. This application Aug. 13, 1979, Ser. No. 65,837
Claims priority, application United Kingdom, Nov. 30, 1977, 49873/77
Int. Cl.³ B01D *47/02*
U.S. Cl. 55—95 **18 Claims**



1. A method of extracting air from dust which comprises passing air carrying dust therein through water in a reservoir, said reservoir being positioned between an inlet and an outlet said air being directed from the air inlet to the water reservoir through a main channel having side walls and providing a baffle means in said reservoir which shapes the water to form an essentially static mass and constrains the air to move through the mass of water in an extended sinuous or tortuous path such that the air enters the surface of said mass via one region and leaves the surface of said mass via another region without creating significant spray or turbulence, said baffle means comprising at least one wedge shaped member at the

lower end of at least one of said side walls of said main channel, at least one upstanding plate with an inwardly bent flange mounted to the bottom of said reservoir lateral to said respective wedge shaped member and at least one shaped plate mounted to the exterior of the sidewall of said main channel having the respective wedge shaped member at the lower end thereof, and thereafter introducing the air leaving said water into a stripping means for removing residual water from said air.

3. A dust extraction apparatus comprising an inlet means for receiving air carrying dust therein, a water reservoir, a means for directing the air from the inlet means to the water reservoir and outlet means for discharging the air after cleaning, said air directing means including a main channel having side walls, said air directing means further including a baffle means which shapes the water in said reservoir into a static mass and guides the air through said static mass of water to create an undulating surface, the air passing through the mass of water in an undulating path below said surface said air entering the mass of water via a lower region of said surface and leaving the mass without the creation of spray or turbulence via an upward region of the surface forming a lateral curtain of water in the reservoir, said baffle means comprising wedge shaped members at the lower ends of the side walls of said main channel, upstanding plates with inwardly bent flanges mounted to the bottom of said reservoir lateral to said wedge-shaped members, and a set of shaped plates mounted to the exterior of the side walls of said main channel having said respective wedge-shaped members at the lower ends thereof.

4,290,785

DUST COLLECTOR AND METHOD OF OPERATION

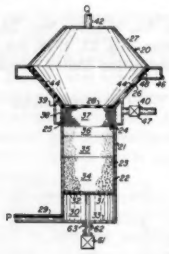
Robert L. Alldredge, 130 Pearl St., Apt. 1108, Denver, Colo. 80210

Filed Feb. 12, 1979, Ser. No. 11,442

The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.

Int. Cl.³ B01D *41/02, 46/04, 46/30*

U.S. Cl. 55—96 **19 Claims**



1. A compressed media dust collector comprising:

(a) a generally vertical filter housing having upper and lower housing portions, the lower housing portion containing a vertical column of at least two contiguous layers of granular filter media, a relatively lower layer having defined coarseness and specific gravity, and a top layer relatively above said lower layer having greater coarseness and lower specific gravity such that the top layer is naturally graded to the top of the column following upwash of the media;

(b) diaphragm means contained in said upper housing portion and moveable between an applied position against said top layer during filter stage to compress the filter media into stationary position and a withdrawn position during wash stage to permit the media to be lifted by wash fluid into the upper housing portion;

(c) a top closing the upper portion of the housing above the diaphragm means;

(d) first fluid passageway means near the bottom of the lower housing portion communicating with said lower layer of the filter media;

(e) second fluid passageway means in said filter housing communicating with said top layer of said media; and

(f) means for supplying pressure to the upper side of the diaphragm means for holding the diaphragm in applied position during filter stage.

13. A method of filtering a dirty gas, comprising:

(a) passing a dirty gas from a supply of such gas into the lower end of a layered column of graded granular filter media contained in a filter housing;

(b) passing the dirty gas first through a lower layer of filter media that is relatively coarse and of defined specific gravity, and then passing the gas through a contiguous upper layer that is relatively finer and of defined specific gravity, the coarseness and specific gravity of the contiguous layers being such that the settling velocity of the media in the lower layer is greater than the settling velocity of the media in the upper layer;

(c) simultaneously with passing the gas through the media compressing the media vertically by means of a diaphragm applied from the top of the column to maintain all media layers in stationary position;

(d) passing gas filtered through the upper layer out of the housing through a first exit;

(e) cleaning captured dirt from the media column by withdrawing the diaphragm from the top thereof and passing wash gas into the lower end of the media column and upwardly therethrough, suspending media grains in the upward flow;

(f) passing the wash gas out of the housing through a second exit; and

(g) terminating the flow of wash gas to permit the media grains to settle in the housing in accordance with the settling velocities of the grains.

4,290,786

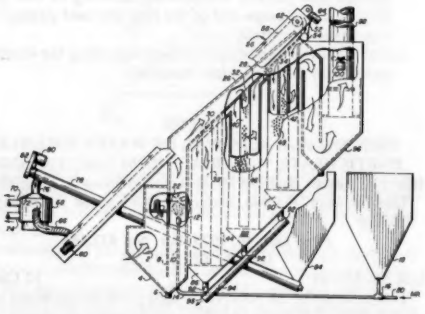
APPARATUS FOR REMOVING PARTICULATE MATTER FROM A GAS STREAM

Richard W. Schuff, Phoenix, Ariz., assignor to Ecotech Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 966,096, Dec. 4, 1978, Pat. No. 4,220,478. This application Jan. 21, 1980, Ser. No. 113,495

Int. Cl.³ B03C *3/12*

U.S. Cl. 55—107 **18 Claims**



1. An apparatus for removing particulate matter from a gas stream, said apparatus comprising in combination:

(a) an inlet plenum for conducting the gas stream containing the particulate matter;

(b) injector means communicating with said inlet plenum for injecting sorbent particles into the gas stream, said injector means injecting the sorbent particles along a predetermined path;

(c) electrostatic charging means located within said inlet plenum and positioned in the path of the injected sorbent particles for electrostatically charging the injected sorbent particles, the particulate matter contained by the gas stream becoming electrostatically charged either through direct contact with said electrostatic charging means or by mixing with the charged sorbent particles;

(d) a source of granular media;

(e) moving bed filter means for receiving granular media and continuously moving the received granular media therethrough, said moving bed filter means communicating with said inlet plenum for directing the gas stream, with the electrostatically charged particulate matter and electrostatically charged sorbent particles therein, through the continuously moving granular media for removing the particulate matter and sorbent particles from the gas stream;

(f) media distributing means coupled to said source of granular media for receiving granular media therefrom and coupled to said moving bed filter means for distributing granular media thereto; and

(g) clean gas outlet means coupled to said moving bed filter means for exhausting a cleaned gas stream therefrom.

11. An apparatus for removing particulate matter from a gas stream, said apparatus comprising in combination:

(a) an inlet plenum for conducting the gas stream containing the particulate matter, said inlet plenum including a distribution portion;

(b) injector means communicating with said inlet plenum for injecting sorbent particles into the gas stream, said injector means injecting the sorbent particles along a predetermined path;

(c) electrostatic charging means positioned in the path of the injected sorbent particles for electrostatically charging the injected sorbent particles, the particulate matter contained by the gas stream becoming electrostatically charged by mixing with the charged sorbent particles;

(d) a plurality of vertically oriented filter cells each having an upper and lower end, each of said filter cells including an outer container having perforated walls and an inner container having perforated walls, said inner container being positioned within said outer container, said filter cells each continuously moving granular media from the upper end of each filter cell to the lower end of each filter cell along a path bordered by said inner and outer containers;

(e) coupling means for coupling said inner container of each of said filter cells to the distribution portion of said inlet plenum to allow the gas stream, with the particulate matter and sorbent particles therein, to pass through the perforated walls of said inner container, through the moving granular media, and through the perforated walls of said outer container;

(f) clean gas outlet means communicating with said plurality of filter cells for exhausting the gas stream directed through the perforated walls of said inner and outer containers thereof;

(g) a source of granular media; and

(h) media distribution means coupled to the upper end of each of said filter cells for distributing the granular media to each of said filter cells, said media distribution means being inclined with respect to a horizontal plane and having an upper end coupled to said source of granular media;

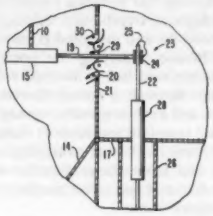
whereby, the granular media falls under the force of gravity through said media distribution means and is distributed to said plurality of filter cells.

4,290,787

BOTTOM-POWERED ELECTROSTATIC PRECIPITATOR

Melvin R. Kahl, Richland, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed May 12, 1980, Ser. No. 148,846
Int. Cl.³ B03C *3/40*
U.S. Cl. 55—120 **3 Claims**



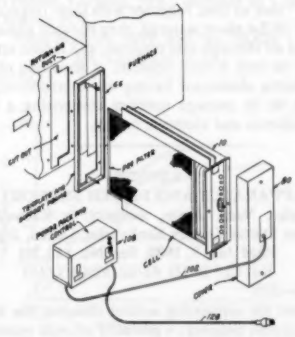
1. An electrostatic precipitator comprising a housing structure enclosing an array of elongate corona-generating electrodes, an upper end of each corona-generating electrode being attached to means for suspending said electrode within said housing structure, a lower end of each corona-generating electrode being attached to an electrically conductive means for applying electric power to said corona-generating electrodes, said electrically conductive means including a lead-in conductor extending outside said precipitator through an aperture in said housing structure to a step-up transformer, said transformer being supported at a level lower than said array of corona-generating electrodes, means for providing a flow of purging gas through said aperture into said housing structure during precipitator operation in order to inhibit accumulation of particulates on said lead-in conductor; and a screen member covering said aperture to prevent accumulation of particulates on said lead-in conductor.

4,290,788

ELECTROSTATIC AIR CLEANER AND MOUNTING MEANS THEREFOR

Robert R. Pittman; Clifford B. Elbrader, and Jimmy L. Milum, all of Harrison, Ark., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 5, 1979, Ser. No. 100,474
Int. Cl.³ B03C *3/12, 3/34*
U.S. Cl. 55—138 **4 Claims**



1. The combination of an electrostatic air cleaner cell and a cutout template and support frame for defining a cutout to be made in the wall of a return air duct for the entry of said cell into the duct and for supporting one end of said cell in the duct

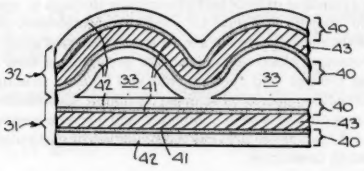
wall, said cell comprising an open, rectangular metal frame supporting positively charged ionizing and collector elements therein, said cell frame consisting of elongated front and rear end members connected at their ends to the ends of two elongated side members, said cutout template and support frame including a flat marginal portion adapted to lie flat against a duct wall and to define a cutout to be made in the duct wall for insertion of said cell, means for securely connecting said flat marginal portion to the duct wall, said elongated front cell frame member having flat portions extending along opposite sides thereof arranged to overlie said flat marginal portion, and guide pins mounted on said marginal portion and arranged to enter apertures in said overlying flat portions of said front frame member when said cell is inserted rear frame member first into the duct through a cutout therein defined by said marginal portion, and a cover member arranged for detachable connection to said template and support frame, and said cover member having portions thereof overlying and engaging said flat portions of said front frame member when said cell is inserted into the duct and said cover member is attached to said template and support frame.

4,290,789

TOTAL ENERGY EXCHANGE APPARATUS

Emerson H. Newton, Arlington, Mass., assignor to Wing Industries, Inc., Cranford, N.J.

Filed Mar. 8, 1979, Ser. No. 18,793
Int. Cl.[3] B01D *53/28*
U.S. Cl. 55—269 **7 Claims**



1. Total energy exchange apparatus having a medium for transferring sensible and latent heat energy, accompanied or not by moisture, between two streams of air within which the apparatus is situated, said medium comprising a hub, a plurality of layers of corrugated sheet material and a corresponding plurality of layers of flat sheet material interleaved alternately with each other, said pluralities of layers being formed by spirally winding respective strips of each of said materials on and around said hub whereby said medium is disposed within an annular area extending outwardly from said hub, the corrugations of said layers of corrugated sheet material being parallel to each other so that, together with their respectively adjacent layers of flat sheet material, they provide passages for the flow of said air through said medium, and means retaining said medium in its said wound relation, at least one of said sheet materials being aluminum having an interractively adherent coating on its air passage surfaces comprising a mixture of hydrated calcium and alumium oxides.

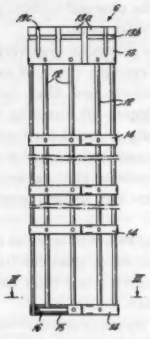
4,290,790

FILTER APPARATUS AND FILTER SUPPORT FRAMES

Kunio Okubo, Nara, Japan, assignor to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Jan. 9, 1980, Ser. No. 110,701
Int. Cl.[3] B01D *46/02*; E04B *1/343*
U.S. Cl. 55—379 **14 Claims**

1. A frame for supporting a filter element, the frame comprising a support member, a plurality of rods extending from the support member and secured thereto, and at least one strap connecting the rods together, said at least one strap having a base part to which is secured each rod, and at least one side wall which projects from the base part, said at least one side wall being formed with a cut-out for each rod for retaining that rod therein such that said frame is generally flat with the support member and said at least one strap generally straight when in an unassembled condition and said support member is bent and said at least one strap is bent in the region of each cut-out until its ends meet or overlap, so that each cut-out is



deformed, to form a generally tubular frame in which each of said rods is substantially enclosed in one of said cut-outs of said at least one strap when in an assembled condition.

12. Filtering apparatus comprising at least one frame as claimed in claim 1 and a filter element mounted on the said at least one frame.

4,290,791

GAS-LIQUID SEPARATOR

Kunio Matsui; Hiroaki Tsuchiya, both of Yokohama; Ryushi Suzuki, Tokyo, and Takayoshi Omura, Matsudo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1980, Ser. No. 133,799
Claims priority, application Japan, Mar. 29, 1979, 54/37295
Int. Cl.[3] B01D *45/12*
U.S. Cl. 55—399 **6 Claims**

1. A gas-liquid separator comprising:

(a) an outer cylinder having a peripheral sidewall and first and second end walls;

(b) a gas collecting inner cylinder having a gas discharge end and disposed within said outer cylinder, said inner and outer cylinders defining an annular space therebetween, said inner cylinder being formed with an arcuate opening in a sidewall portion thereof for communicating said annular space with the interior of said inner cylinder at a selected location between said outer cylinder end walls and being sized to receive gas separated from the introduced fluid by centrifugal separation;

(c) a fluid inlet provided proximate said first end wall of the outer cylinder, said fluid inlet being tangential to said peripheral sidewall of said outer cylinder for introducing fluid into said annular space and in conjunction with the said walls of said outer cylinder being adapted to impart an initial circular motion to the introduced fluid leaving said inlet;

(d) a fluid outlet provided proximate the second end wall of the outer cylinder;

(e) means for imparting a helical flow to the circulating fluid, the helical flow carrying the fluid in said annular space from proximate said fluid inlet to proximate said fluid outlet, said means including annular guide plates defining fluid passageways; and

(f) means communicating with said discharge end of the inner cylinder for removing separated gas therefrom.

4,290,792

FILTER CONSTRUCTION

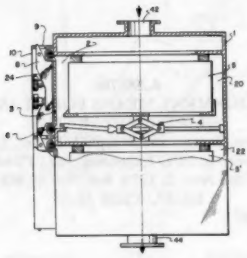
Wolfgang Eckstein, Sereetz; Karl-Heinz Schirk, Lübeck, and Detlef Reinhold, Bad Oldeslow, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,644

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936614

Int. Cl.³ B01D 46/10

U.S. Cl. 55—480 3 Claims



1. In a filter construction, particularly for vehicle compartments and other spaces closed to the outside, of the type having a housing with a filter compartment for containing a filter element and an opening to the compartment, and a removable cover closing the opening, an improved locking arrangement comprising a slot defined in the housing, a locking mechanism including a pedestal mounted to the cover, a lever member pivotably mounted to the pedestal having a nose extendable into said slot in a locked position and being movable out of said slot when said lever member is moved to an unlocked open position, means defining a bayonet catch between said pedestal and said lever member for interengaging said lever member with said pedestal when said lever member is in the locked position and being releasable to permit pivoting of said lever member to an unlocked position which brings said nose out of the spot, and spring means for resiliently urging said lever member away from said pedestal.

4,290,793

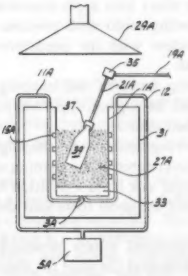
FLUID BED CHEMICAL STRENGTHENING OF GLASS OBJECTS

M. Clifford Brockway, Columbus, Ohio, assignor to Liberty Glass Company, Sapulpa, Okla.

Filed Dec. 8, 1978, Ser. No. 967,567

Int. Cl.³ C03B 25/06, 25/10, 27/00

U.S. Cl. 65—30.14 14 Claims



1. A process for strengthening a glass object by chemical reaction at the glass surface of said object between the glass and a chemical strengthening agent reactive with the glass to alter its composition and thereby either directly generate compressive stress therein or reduce the thermal expansion coefficient thereof, comprising the steps of:

kinetically contacting said object with a chemical strengthening agent in a bed comprising gas-fluidized particulate solid material under conditions of temperature and active fluidization such that said reaction proceeds but the formation of either stress-concentrating surface defects or an adherent coating of said solid material on the surface of said object is substantially avoided, said solid particulate material comprising an ionic glass material containing cations whose ionic diameters are different from the ionic diameters of cations of the glass of which said object is constituted and said reaction comprising exchange of cations of the ionic glass material for the cations of the constituent glass of the object;

maintaining said object in said bed for a time sufficient for the reaction to alter the composition of a marginal stratum of said object adjacent said surface;

and

cooling said object, thereby producing an object of increased strength and toughness having said marginal stratum under compressive stress.

13. A process for strengthening a silicate glass object by a nitriding reaction at the glass surface of said object between the glass and a chemical strengthening agent effective for nitriding the glass to alter its composition and thereby either directly generate compressive stress therein or reduce the thermal expansion coefficient thereof, comprising the steps of:

kinetically contacting said object with a chemical strengthening agent in a bed comprising gas-fluidized particulate solid material under conditions of temperature and active fluidization such that said reaction proceeds but the formation of either stress-concentrating surface defects or an adherent coating of said solid material on the surface of said object is substantially avoided, said solid particulate material comprising boron nitride which serves as a nitriding agent for reaction with said glass object;

maintaining said object in said bed for a time sufficient for the reaction to alter the composition of a marginal stratum of said object adjacent said surface;

and

cooling said object, thereby producing an object of increased strength and toughness having said marginal stratum under compressive stress.

4,290,794

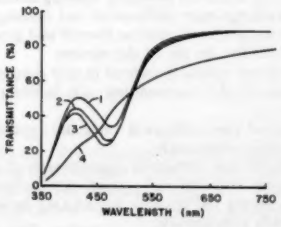
METHOD OF MAKING COLORED PHOTOCHROMIC GLASSES

Brent M. Wedding, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,436

Int. Cl.³ C03C 3/20

U.S. Cl. 65—30.11 11 Claims



1. A method for producing different shades of a yellow to orange tint in a surface layer in a transparent photochromic glass article, the differences in shade being due to a major variation in luminous transmittance of the glass with a minor

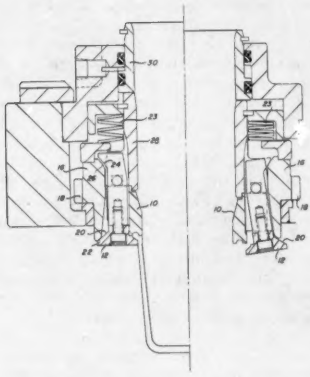
shift in the chromaticity thereof and the hues of which will remain essentially unchanged after subsequent heat treatments up to about the strain point of the glass, said photochromic glass containing crystals selected from the group of silver chloride, silver bromide, and silver iodide as the photochromic agents and containing at least 0.5% lead, expressed as PbO, in the composition thereof, said method comprising exposing at least a portion of said photochromic article to a gaseous reducing environment at a temperature ranging from about the strain point to about 50° C. above the annealing point of the glass for a time of at least 0.5 hour to cause in the surface of said glass silver ions to be reduced to metallic silver particles and lead ions to be reduced to metallic lead particles which either coat or alloy with the metallic silver.

4,290,795

NECK RING ASSEMBLY FOR AUTOMATIC BLOW MOLDING MACHINES

Armando N. Cabrera, Monterrey, Mexico, assignor to Investigacion Fic Fideicomiso, Monterrey, Mexico

Filed May 13, 1980, Ser. No. 149,424
Int. Cl.[3] C03B *9/325*
U.S. Cl. 65—260 **1 Claim**



1. A rotatable ware supporting neck ring assembly for a blow molding machine comprising in combination:

a horizontal support member;

an annular bushing mounted for rotation on a vertical axis on said support member;

a plurality of segments individually pivotally supported on horizontal axis and surrounding said bushing, each having a foot portion, which in the closed ware supporting position of the assembly are in intimate contact with each other and with the lower axial and radial faces of said bushing;

means defining a radially inwardly opening annular groove in the adjoining inner surfaces of said bushing and said segments in the closed position thereof said groove forming the mold for the rim of the parison;

an annular sleeve rotatably carried in said support member and concentrically surrounding said bushing and segments;

first and second cam surfaces at vertically opposite ends of each segment respectively;

third and fourth cam surfaces at opposite ends of said sleeve for engaging said first and second cam surfaces of said segments during the opening and closing movements of the assembly respectively;

means mounting said bushing and segments for sliding vertical movement on said support member between upper and lower positions so that in the upper position said foot portions of said segments are cammed radially inwardly into tight engagement with each other and with the lower portion of said bushing and in the lower position said segments are cammed out of engagement with each other and the lower portion of said bushing; and

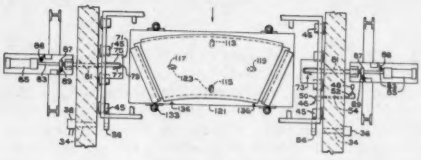
hydraulic means for moving said bushing and segments downwardly to cam said segments to open, warereleasing position.

4,290,796

MOLD ALIGNMENT MEANS FOR GLASS SHEET SHAPING APPARATUS

Thomas J. Reese, Sarver, and Joseph J. Fisher, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1979, Ser. No. 90,943
Int. Cl.[3] C03B *23/03*
U.S. Cl. 65—287 **14 Claims**



1. An apparatus for shaping a glass sheet to a predetermined shape, comprising:

an elongated heating lehr comprising:

a heating zone to heat the sheet to its shaping temperature; and

a shaping station to shape the sheet;

a carriage;

a conveyor extending longitudinally through said lehr along a substantially horizontal longitudinal reference line from said heating zone to said shaping station for advancing said carriage from said heating zone into said shaping station along a path;

an outline sheet supporting mold;

means mounted on said carriage and acting on said supporting mold for longitudinally and laterally adjusting the position of said supporting mold with respect to said carriage to position a predetermined center of said supporting mold in vertical alignment with a corresponding predetermined center of said carriage;

stop means mounting said outline sheet supporting mold for guiding the sheet into a predetermined position on said sheet supporting mold with predetermined center of the sheet coincident with the predetermined center of said outline mold;

a lower shaping mold in said shaping station, said lower shaping mold having an upper shaping surface having a predetermined center;

means for moving said lower shaping mold to move the predetermined center of the shaping surface upward along a fixed vertical axis from a position beneath the path to a position to lift the sheet from said sheet supporting mold; and

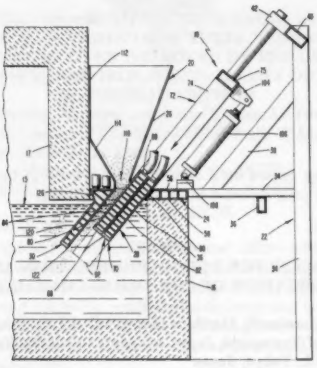
mechanical alignment means mounted adjacent said conveyor and acting on said carriage for aligning and maintaining said sheet supporting mold in a predetermined horizontal orientation over said lower shaping mold with the predetermined center of said sheet supporting mold along the fixed vertical axis of said shaping surface of said lower shaping mold.

4,290,797

APPARATUS FOR DISPENSING AND SUBMERSING BATCH MATERIALS IN A MOLTEN GLASS FURNACE

Anthony T. Rossi, Bradenton, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.

Filed Feb. 6, 1980, Ser. No. 118,978
Int. Cl.[3] C03B 3/00
U.S. Cl. 65—335 5 Claims



1. Apparatus for feeding glass batch materials into a pool of molten glass within a furnace, comprising:

a base disposed at a batch-feeding end of the furnace above and extending over the pool of molten glass,

a hopper for dispensing glass batch materials mounted on said base and including an outlet disposed over said pool of molten glass such that all of the dispensed batch materials enter said pool from above,

a plunger means mounted on said base and including a reciprocable plunger and an actuator for reciprocating the plunger in a vertically inclined linear direction past said hopper outlet into and from the pool of molten glass at the location where batch materials are deposited thereon;

said plunger including a front pusher face for pushing dispensed batch materials beneath the surface of the pool of molten glass, and

a barrier mounted on said base and disposed on a side of said hopper outlet opposite said plunger, said barrier extending into the pool of molten material substantially parallel to the direction of reciprocation of said plunger and terminating adjacent the lowermost extent of travel of said pusher face so that batch materials submerged by said plunger travel beneath and past said barrier and are isolated from said batch depositing location.

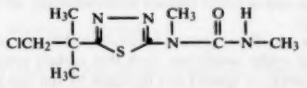
4,290,798

HERBICIDAL COMPOUND AND METHOD OF USE

Tony Cebalo, Indianapolis, Ind., and Robert A. Walde, Allison Park, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 783,521, Apr. 1, 1977, abandoned, which is a division of Ser. No. 601,739, Aug. 4, 1975, abandoned, which is a continuation of Ser. No. 453,630, Mar. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 280,605, Aug. 14, 1972, abandoned. This application Nov. 29, 1978, Ser. No. 964,757
Int. Cl.[3] A01N 47/36; C07D 285/12
U.S. Cl. 71—90 3 Claims

1. 1-[5-(2-Chloro-1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-1,3-dimethylurea, having the formula



2. A herbicidal composition comprising an inert carrier in admixture with a herbicidal proportion of the compound of claim 1.

3. A method of controlling undesired vegetation which comprises applying to the locus of the undesired vegetation a herbicidally-effective amount of the compound of claim 1.

4,290,799

FERROMAGNETIC METAL PIGMENT ESSENTIALLY CONSISTING OF IRON AND A PROCESS FOR ITS PRODUCTION

Gerhard Schroeder; Gunter Buxbaum; Franz Hund; Heinrich-Christian Schopper, and Rolf Naumann, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,399
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909480
Int. Cl.[3] B22F 1/00
U.S. Cl. 75—0.5 A 13 Claims

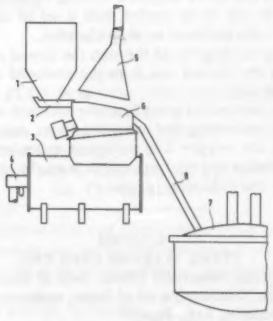
1. A metal powder, suitable for magnetic recording, consisting essentially of iron, the individual particles being acicular and containing on average no more than 5 pores and consisting on average of no more than 2 metal cores.

4,290,800

PROCESS FOR FEEDING IRON SPONGE INTO AN ELECTRIC ARC FURNACE

Siegfried Sensis, Seevetal; Joachim Schwerdtfeger, Barum; Klaus Walden, Buxtehude, and Dieter Ameling, Schwiederstorf, all of Fed. Rep. of Germany, assignors to Hamburger Stahlwerke GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 76,227
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840945
Int. Cl.[3] C21C 5/52
U.S. Cl. 75—12 10 Claims



1. A method of preheating carbon containing iron sponge, said method characterized by the non-combustion of said iron sponge, the method comprising steps of:

providing carbon bearing iron sponge which contains at least 0.5% carbon;

moving the iron sponge into a melting crucible;

providing a stream of oxidizing hot gas, the hot gas having a temperature of at least 1200° C. and having a flow rate of at least 1 m/s as measured at 20° C. and 760 Torr;

flowing the hot gas through the iron sponge in a direction

transverse to the direction of movement of the iron sponge and in direct contact with essentially all of the iron sponge;

effecting said direct contact between the hot gas and the iron sponge under conditions such that carbon present in the iron sponge is ignited and oxidized by the hot gas.

4,290,801

METHOD AND INSTALLATION FOR THE COOLING OF REDUCED MATERIAL SUCH AS FINE GRAINED ORE

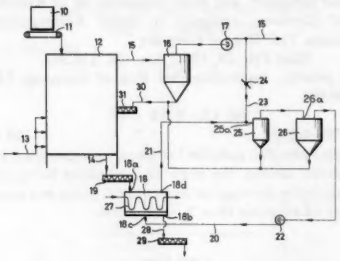
Alfred Kryczun, and Theodor Manshausen, both of Cologne, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,550

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809172

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—21 **1 Claim**



1. An in-line method of cooling reduced fine grained ore, from a reduction process, where quantities of oxygen free reduction gases are generated by the process which comprises the steps of:

cooling and cleaning a portion of the oxygen free reduction gases,

supplying reduced ore at a selected rate to an enclosed cooling chamber,

continuously recirculating at a positive pressure the cooled and cleaned oxygen free reduction gases through the reduced ore in the enclosed cooling chamber,

passing the ore to be cooled over a set of closed cooling pipes in the enclosed cooling chamber,

circulating cooling liquid through the closed cooling pipes,

removing the cooled ore from the enclosed chamber at a selected rate,

removing the cooling gases from the enclosed cooling chamber and recleaning and recooling them, and

replacing any oxygen free reduction gases lost during the recirculation and cooling process from the quantity generated by the reduction process.

4,290,802

STEEL MAKING PROCESS

Takeyuki Hirata; Nobuyoshi Hiroki, both of Ibaraki, and Seiichi Masuda, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Japan

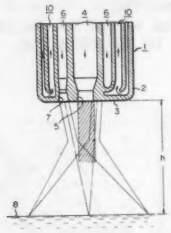
Filed May 29, 1980, Ser. No. 154,217

Claims priority, application Japan, Jul. 3, 1979, 54-84521

Int. Cl.³ C21C *5/32, 5/34*

U.S. Cl. 75—52 **5 Claims**

1. An oxygen top-blowing steelmaking process comprising preparing a molten metal suitable for producing steel in a basic oxygen furnace, carrying out top-blowing and bottom-blowing, said bottom-blowing being carried out at least partly during the period of time from the beginning of blowing to the tapping of the melt, and then tapping the resulting molten steel, characterized in that a powder of a slag-forming agent is introduced into the molten metal together with the top-blowing oxygen jet injected through an oxygen lance, said slag-forming



agent being passed on a carrier gas to the tip of the oxygen lance by a path separate from the oxygen lance.

4,290,803

PROCESS FOR DEPHOSPHORIZATION AND DENITRIFICATION OF CHROMIUM-CONTAINING PIG IRON

Shigeaki Maruhashi; Morihiro Hasegawa, and Takashi Yamauchi, all of Yamaguchi, Japan, assignors to Nisshin Steel Company, Ltd., Tokyo, Japan

Filed Jun. 13, 1980, Ser. No. 159,097

Claims priority, application Japan, Jun. 29, 1979, 54-081285

Int. Cl.³ C21C *7/02;* **C22B** *9/10*

U.S. Cl. 75—52 **14 Claims**

1. A process for dephosphorization-denitrification of molten pig iron containing not less than 3% of Cr, comprising maintaining the Si concentration of said molten pig iron at 0.2% by weight or less, contacting said pig iron with a slag comprising 30–80% by weight of at least one selected from fluorides and chlorides of alkaline earth metals, 0.4–30% by weight of at least one selected from lithium oxide and lithium carbonate, and 5–50% by weight of at least one of iron oxides and nickel oxide, said slag may contain less than 40% by weight of at least one selected from oxides and carbonates of alkaline earth metals, while controlling oxidation of Cr.

4,290,804

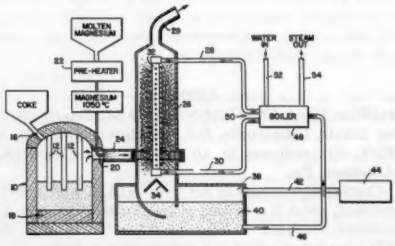
METHOD FOR PRODUCING MAGNESIUM

Julian M. Avery, 47 Old Orchard Rd., Chestnut Hill, Mass. 02167

Filed Feb. 26, 1980, Ser. No. 124,706

Int. Cl.³ C22B *45/00*

U.S. Cl. 75—67 R **9 Claims**



1. The process for recovering magnesium from a vaporous composition comprising magnesium and carbon monoxide, said composition having a temperature above the temperature at which substantial reaction of magnesium and carbon monoxide occurs which comprises contacting said vaporous composition with liquid magnesium heated to a temperature between

about 800° C. and 1100° C. so as to vaporize a substantial portion of said liquid magnesium and to reduce the temperature of said vaporous composition to below about 1500° C. substantially instantaneously in order to minimize back oxidation of magnesium with carbon monoxide and subsequently cooling said vaporous composition to condense said magnesium.

4,290,805

METHOD FOR OBTAINING IRON-BASED ALLOYS ALLOWING IN PARTICULAR THEIR MECHANICAL PROPERTIES TO BE IMPROVED BY THE USE OF LANTHANUM, AND IRON-BASED ALLOYS OBTAINED BY THE SAID METHOD

Mario Gorgerino, Meyzieu, and Daniel Videau, Le Touvet, both of France, assignors to Compagnie Universelle D'Acetylene et D'Electro-Metallurgie, France

Filed Apr. 3, 1979, Ser. No. 26,778

Claims priority, application France, Apr. 6, 1978, 78 10254

Int. Cl.³ C22C *33/08*

U.S. Cl. 75—130 R **17 Claims**

1. A method for obtaining iron-based alloys substantially devoid of pinholes and cavities in spheroidal graphite cast-irons, and of carbides in flaky graphite grey-iron, while providing improved castibility, rollability, anisotropy and mechanical properties thereof, which comprises adding 0.0001 to about 2 weight percent of lanthanum to the said iron-based alloy during its production.

4,290,806

COPPER ALLOY FOR RELIABLE ELECTRICAL CONNECTION

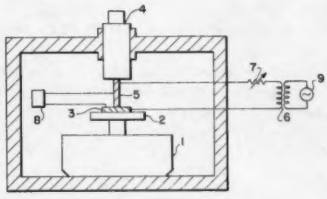
Sadao Inoue, Nikko; Tetsuya Umemura, Ichihara; Hiroshi Suzuki, Yokohama, and Makoto Tago, Tokyo, all of Japan, assignors to Furukawa Metals Company, Ltd., Tokyo, Japan

Filed Sep. 25, 1979, Ser. No. 78,883

Claims priority, application Japan, Sep. 25, 1978, 53/117727

Int. Cl.³ C22C *9/00*

U.S. Cl. 75—153 **3 Claims**



1. A copper alloy for giving a reliable connection in mechanical contact with an electric wire, which consists essentially of 0.6–3.9 wt. % of Co, 0.03–0.4 wt. % of P, the balance being composed of Cu and impurities thereof.

4,290,807

HARD ALLOY AND A PROCESS FOR THE PRODUCTION OF THE SAME

Tsuyoshi Asai; Naoji Fujimori, and Takaharu Yamamoto, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 13, 1978, Ser. No. 942,499

Claims priority, application Japan, Sep. 20, 1977, 52/112943; Dec. 23, 1977, 52/156145; Jan. 24, 1978, 53/007021; Jan. 24, 1978, 53/007022; Mar. 15, 1978, 53/30360; Mar. 16, 1978, 53/30357

Int. Cl.³ C22C *29/00*; B22F *3/00*

U.S. Cl. 75—233 **13 Claims**

1. A sintered hard alloy consisting of a metallic phase and a hard phase having a B1 type crystal structure and being represented by the following general formula:

$$(M_{1a}, M_{2b})(C_{1-x-y}, N_y, O_x)_z$$

in which M_1 is at least one of the Group IVa elements, M_2 is at least one of the Group VIa elements, C is carbon, N is nitrogen, O is oxygen, a, b, x and y are respectively atomic ratios satisfying the relations of $a+b=1$, $0.1 \leqq a/(a+b) \leqq 0.7$, $0.08 < x \leqq 0.5$, $0 \leqq y \leqq 0.5$ and $0.05 \leqq x+y \leqq 0.6$ and z is an atomic ratio of $(C+O+N)/(M_1+M_2)$ satisfying the relation of $0.1 \leqq z \leqq 0.5$.

11. A process for producing a sintered hard alloy represented by the following general formula:

$$(M_{1a}, M_{2b}, M_{3c})(C_{1-x-y}N_yO_x)_z$$

in which M_1 is at least one of the Group IVa elements, M_2 is at least one of the Group VIa elements, M_3 is at least one of the Group Va elements, C is carbon, N is nitrogen, O is oxygen, a, b, c, x, y and z are respectively atomic ratios satisfying the relations of $a+b+c=1$ in which c can be zero, $0.05 \leqq x \leqq 0.5$, $0 \leqq y \leqq 0.5$, $0.05 \leqq x+y \leqq 0.6$ and z is an atomic ratio of $(C+N+O)/(M_1+M_2+M_3)$ satisfying the relation of $0.1 \leqq z \leqq 0.5$, which comprises pressing and sintering the powdered starting materials necessary to produce the sintered alloy of the above formula, at least a part of the sintering step being carried out in an atmosphere of carbon monoxide of at least 10^{-1} Torr.

4,290,808

METALLIC GLASS POWDERS FROM GLASSY ALLOYS

Ranjan Ray, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 23, 1979, Ser. No. 23,411

Int. Cl.³ B22F *9/04, 9/06*

U.S. Cl. 75—251 **4 Claims**

1. Metallic glass powder having particle size of less than 4 mesh (U.S. Standard) comprising platelets having thickness of less than 0.1 millimeter, each platelet being of substantially uniform thickness throughout, and each platelet being defined by an irregularly shaped outline resultant from fracture of a substantially uniform thickness rapidly solidified embrittled amorphous material.

4,290,809

RAW MIX FLUX FOR CONTINUOUS CASTING OF STEEL

Charles M. Loane, Jr., Bel Air, Md., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 6, 1980, Ser. No. 175,620

Int. Cl.³ C22B *9/10*

U.S. Cl. 75—257 **4 Claims**

1. A flux composition, said composition being a mix of ceramic raw materials and having the following theoretical analysis based on the composition formed on melting the raw materials:

K_2O: 0 to 5 percent by weight
Na_2O: 20 to 35 percent by weight
CaO: 5 to 25 percent by weight
MgO: 0 to 1 percent by weight
Al_2O_3: 3 to 10 percent by weight
B_2O_3: 15 to 30 percent by weight
SiO_2: 5 to 20 percent by weight
F: 10 to 25 percent by weight
Fe_2O_3: 0 to 1 percent by weight

and wherein the percentages of said ingredients total 100 percent by weight.

4,290,810

METHOD FOR FACILITATING TRANSPORTATION OF PARTICULATE ON A CONVEYOR BELT IN A COLD ENVIRONMENT

Carl T. Montgomery, Sperry, Okla., assignor to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 860,501, Dec. 14, 1977, Pat. No. 4,162,347. This application May 4, 1979, Ser. No. 36,219

Int. Cl.[3] **B32B** *9/04;* **C09K** *3/118*

U.S. Cl. 106—13 **8 Claims**

1. A composition for treating a belt surface consisting essentially of from about 0.05 to about 2% by weight a dimethyl polysiloxane, with the balance consisting essentially of water soluble components

(A) a water soluble polyhydroxy compound or monoalkyl ether thereof, and, per part by weight of (A),

(B) from about 0.001 to about 2 parts a water soluble nonvolatile organic compound having at least one hydrophilic group, said compound (B) being different from said compound (A),

said composition being substantially free of corrosion inducing metal halide salts and said water soluble components contain less than about 5% of water immiscible liquids.

4,290,811

METHOD OF PRODUCING SILICATE BINDERS AND COATINGS

Kenneth H. Brown, and Kenneth M. Wolma, both of Evanston, Ill., assignors to Rust-Oleum Corporation, Vernon Hills, Ill.

Filed Mar. 31, 1980, Ser. No. 136,152

Int. Cl.[3] **C09D** *5/10*

U.S. Cl. 106—1.17 **7 Claims**

1. A method of making a hydrolyzed alkyl silicate binder which comprises:

a. dissolving an alkyl silicate, wherein the alkyl groups range from 1 to 4 carbon atoms, in an organic solvent containing sufficient anhydrous strong acid form ion exchange resin to effectively catalyze the hydrolysis reaction; and

b. adding a quantity of water of an amount sufficient to provide 0.125 to 0.475 moles of water for each alkoxy group carried by the alkyl silicate,

and c. removing the ion exchange resin after the reaction is completed.

4. A method of making a zinc-rich coating which comprises:

a. dissolving an alkyl silicate, wherein the alkyl groups range from 1 to 4 carbon atoms, in an organic solvent containing sufficient anhydrous strong acid form ion exchange resin to effectively catalyze the hydrolysis reaction of the alkyl silicate;

b. adding a quantity of water of an amount sufficient to provide 0.125 to 0.475 moles of water for each alkoxy group carried by the alkyl silicate;

c. removing the ion exchange resin after the reaction is completed;

d. adding a quantity of pigments and rheological additives dispersed in anhydrous organic solvent; and

e. adding a quantity of finely divided zinc dust.

4,290,812

PROCESS FOR THE PRODUCTION OF INKS FREE OF FOREIGN SALTS

Ehrenfried Loock, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jul. 28, 1980, Ser. No. 173,069

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930491

Int. Cl.[3] **C09D** *11/00;* **C07C** *107/00*

U.S. Cl. 106—22 **21 Claims**

1. A process for the production of an ink, free from foreign salts, from a technical anionic dye, comprising:

(a) dissolving at least one highly water-soluble dye in water to form an aqueous solution;

(b) precipitating the dye from this aqueous solution by adding a precipitant organic amine to form an insoluble precipitated dye;

(c) separating said precipitated dye from said solution;

(d) converting said precipitated dye into a highly water-soluble form by distillation in the presence of water and a water-soluble amine of low volatility; and

(e) dissolving the water-soluble dye obtained in step (d) in a solvent to obtain a dye solution.

4,290,813

PHOTOCHROMIC BORO-SILICATE GLASS

Harry Owen, Parbold, and Thomas Barrow, Ormskirk, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 764,315, Jan. 31, 1977, Pat. No. 4,102,693. This application May 18, 1978, Ser. No. 907,222

Claims priority, application United Kingdom, Jan. 31, 1976, 3785/76

The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.

Int. Cl.[3] **C03C** *3/10, 3/08, 3/26*

U.S. Cl. 501—13 **5 Claims**

1. A photochromic boro-silicate glass which has a half-fading time of not more than 145 secs, which has silver halide crystals dispersed throughout the glass, and which is free from barium, consisting essentially of, in weight percentages:

SiO_2—31 to 59%
B_2O_3—18 to 28%
Al_2O_3—8 to 20%
R_2O—6 to 16%
MgO—0 to 2.6%
P_2O_5—0 to 12%
ZrO_2—0 to 7%
TiO_2—0 to 5%
PbO—0 to 7%

where R_2O represents one or more of Li_2O, Na_2O and K_2O in amounts within the ranges 0 to 3% Li_2O, 0 to 8% Na_2O and 0 to 16% K_2O,

and, in weight percentages expressed as quantities over and above the 100% total of all the other components:

silver, expressed as Ag_2O—0.05 to 4%
halide—0.13 to 1%
CuO—0 to 1%.

4,290,814

HIGH ALUMINA BRICK

Stanley R. Pavlica, Irwin, and Donald O. McCreight, Bethel Park, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 17, 1979, Ser. No. 67,582

Int. Cl.[3] **C04B** *35/10, 35/12, 35/48*

U.S. Cl. 501—107 **3 Claims**

1. A ceramically bonded, high alumina, refractory brick produced by the process of pressing and firing a mixture consisting essentially of from about 3 to 30%, by weight, of at least one material selected from the group consisting of fused zirconia-mullite grain and fused zirconia-alumina grain, from about 1 to 15% by weight, of finely divided chromic oxide and the balance a high alumina granular refractory material, said fused grain being substantially all $-4+65$ mesh particle size, said brick being characterized by having relatively good spalling resistance.

4,290,815

USE OF CO-SOLVENTS IN AMINE N-OXIDE SOLUTIONS

Charles L. Henry, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 28, 1980, Ser. No. 111,290
Int. Cl.[3] C08J *3/04, 3/08;* C08L *1/02*
U.S. Cl. 106—203 10 Claims

1. A solution comprising:
(a) cellulose;
(b) a tertiary amine N-oxide solvent for said cellulose;
(c) a cellulose solubility-enhancing amount of water;
(d) a solution processability-enhancing amount of a co-solvent, miscible with said tertiary amine N-oxide, selected from compounds containing primary, or combinations of primary and secondary, amino groups wherein the amino groups are bonded to alkyl, alicyclic, alkyl ether or alkyl-/alicyclic radical(s) and wherein the number of carbon atoms divided by the number of primary amine groups is approximately equal to or less than 4, and the number of primary amine groups divided by the number of secondary amine groups is equal to or greater than 1.

4,290,816

SULFUR COMPOUNDS AND METHOD OF MAKING SAME

Allen C. Ludwig; John M. Dale, and Henry F. Frazier, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jan. 29, 1979, Ser. No. 7,042
Int. Cl.[3] C09K *3/00*
U.S. Cl. 106—287.32 18 Claims

1. A process for modifying elemental sulfur to produce a material having properties such that it can be used as a substitute for asphalt or portland cement comprising reacting elemental sulfur
(1) with from 5 to 20 weight percent of the sulfur of a first hydrocarbon containing from 4 to 20 carbon atoms
(a) which is a diolefin or triolefin with the unsaturated portion being reactable with elemental sulfur and
(b) which by itself when reacted with elemental sulfur forms a gel and
(2) with from 5 to 20 weight percent of the sulfur of a second hydrocarbon containing from 2 to 20 carbon atoms
(a) which is a monolefin reactable with elemental sulfur and
(b) which by itself when reacted with sulfur does not form a gel but forms a brittle product and
(c) which when the first and second hydrocarbons are so reacted with sulfur prevents said gel from forming;
(3) said reaction being initiated by heating the reactants to a temperature in the range of 120° to 200° C. and sufficiently high to cause an exothermic reaction between the reactants and
(4) producing a product having a viscosity curve substantially that of asphalt, a penetration of from 5 to 100, a softening point of from 10° C. to 70° C. and a ductility of at least 100.

4,290,817

GLUCOHEPTONATE COMPOSITION

Jose' L. Villa, Bridgewater; Joseph V. Sinka, Mendham, and Joseph P. Fleming, East Brunswick, all of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jan. 16, 1980, Ser. No. 112,564
Int. Cl.[3] C04B *7/02*
U.S. Cl. 106—315 6 Claims

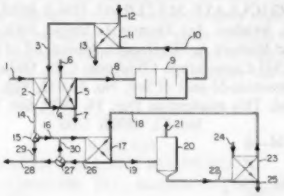
1. A process for eliminating ammonia odor from water soluble salt of glucoheptonate having present residual ammonium ion when said salt is introduced into aqueous media having a pH above 9, comprising adding to an aqueous solution of said glucoheptonate before introducing said glucoheptonate into said aqueous media a free acid form of naphthalenesulfonic acid-formaldehyde condensation product in an amount sufficient to react with said ammonium ion.

4,290,818

PROCESS FOR UTILIZING THE WASTE HEAT CONTENT OF CONDENSATE AND/OR VAPOR PRODUCED IN THE MANUFACTURE OF SUGAR

Herbert Huber, Waldseerstrasse 106, D6707 Schifferstadt, and Hubert Schiweck, John-F. Kennedy-Strasse 5, D-6520 Worms, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 916,508, Jun. 19, 1978, abandoned. This application Oct. 31, 1979, Ser. No. 89,863
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2729192
Int. Cl.[3] C13D *3/00;* C13G *1/00;* C13F *1/00*
U.S. Cl. 127—52 6 Claims



1. A process for utilizing the waste heat content of condensate and vapour produced in the manufacture of sugar during the purification and the concentration of sugar-containing juice, which process comprises the steps of:
(a) cooling an initial first thin juice obtained by the filtration of juice from the first carbonation stage of a process for manufacturing sugar to produce a cooled first thin juice;
(b) subjecting the cooled first thin juice to one or more stages of flash evaporation to concentrate and further cool the juice to produce a concentrated first thin juice;
(c) heating the concentrated first thin juice in two stages to substantially the original temperature of said initial first thin juice by means of, in the first stage, condensate and-/or vapour produced elsewhere in the sugar manufacturing process and, in the second stage, said initial first thin juice, thereby cooling the latter;
(d) subjecting the juice obtained in (c) to a second carbonation stage to obtain an initial second thin juice;
(e) introducing the initial second thin juice from the second carbonation stage into a first evaporator of a multiple effect evaporating plant to produce a partially concentrated second thin juice;
(f) passing the partially concentrated second thin juice through at least one other evaporator of the evaporating plant to concentrate the juice further;
(g) introducing the juice from step (f) into a final evaporator of the evaporating plant to produce juice concentrated to a required degree and to produce a vapour; and
(h) compressing the vapour from the final evaporator and selectively returning the compressed vapour to one of the preceding evaporators of the evaporating plant for use in heating the juice being concentrated therein.

4,290,819

METHOD AND COMPOSITION FOR THE REMOVAL OF PHENOLIC RESIN COATINGS FROM ALUMINUM

Edwin P. Cornwall, and Walter Batiuk, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1980, Ser. No. 109,244
Int. Cl.[3] C23G *1/02;* C11D *7/00;* C23G *1/02*
U.S. Cl. 134—3 9 Claims

1. A process for removing the phenolic resin coating from a phenolic resin coated aluminum object, comprising the steps of:

applying an aqueous solvent solution consisting essentially of from 60 to 76% by weight of HNO_3 and from 2 to 11% by weight of CrO_3 to the phenolic resin coating,

maintaining said solvent solution at a temperature of about 160° to 170° F. for a sufficient time to dissolve said phenolic coating, and

rinsing with water to remove the solution and drying.

4,290,820

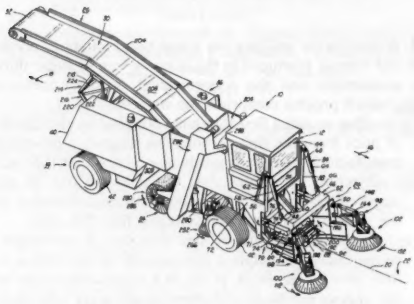
METHOD AND APPARATUS FOR COLLECTING PARTICULATE MATERIAL ON A ROADWAY

George W. Swisher, Jr.; Thomas L. Steele, both of Oklahoma City, and Richard A. Silbernagle, Moore, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 10,022, Feb. 7, 1979, abandoned. This application Dec. 14, 1979, Ser. No. 103,455

Int. Cl.³ B08B *7/00*

U.S. Cl. 134—6 **36 Claims**



35. A method for collecting particulate material scattered along a collection path on a roadway surface comprising the following steps in order:

(a) sweeping particulate material disposed along the collection path into a windrow substantially coincident with the collection path;

(b) collecting substantially all of the particulate material of the windrow by scooping said material onto a first material lifting apparatus as said material lifting apparatus is moved along the collection path;

(c) moving the collected particulate material on the first material lifting apparatus to an overhead discharge position;

(d) sweeping residual particulate material remaining on the roadway following step (b) into a residual windrow along the collection path;

(e) sweeping the residual particulate material of the residual windrow onto a second material lifting apparatus as said material lifting apparatus is moved along the collection path;

(f) moving the collected residual material on the second material lifting apparatus to the overhead discharge position so that the collected particulate material carried by the first material lifting apparatus and the collected residual material carried by the second material lifting apparatus are combined to form a combined discharge material; and

(g) dropping the combined discharge material into a selected trailing receiving vehicle.

4,290,821

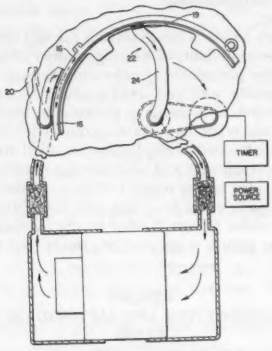
TAPE CARTRIDGE STRAP CLEANING METHOD

Phillip A. Cosby, Arlington, Tex., assignor to Graham Magnetics, Inc., North Richland Hills, Tex.

Division of Ser. No. 948,704, Oct. 5, 1978, Pat. No. 4,123,223. This application Feb. 28, 1980, Ser. No. 125,622

Int. Cl.³ B08B *9/04*

U.S. Cl. 134—8 **4 Claims**



1. A process for cleaning interior walls of a ring-like strap of the type used to hold and release magnetic tape for fluidic feeding in tape-reading apparatus, the strap comprising an annular conduit between interior and exterior walls of said strap, said conduit terminating in spaced apertures in said interior wall thereof, said process comprising the steps of

(a) supplying the air through said exterior wall under pressure into said annular conduit to maintain positive airstreams coming out of said apertures in said interior wall and, thereby, preventing dirt in interior walls from being forced into said apertures while

(b) carrying out a relative rotation between (1) a suction-cleaning means mounted in biased contact with said interior wall and (2) the interior wall of said strap.

4,290,822

PROCESS FOR CLEANING A COLD TRAP

Jean-Pierre Maupre, and Jean Trouve, both of Pertuis, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 14, 1979, Ser. No. 94,165

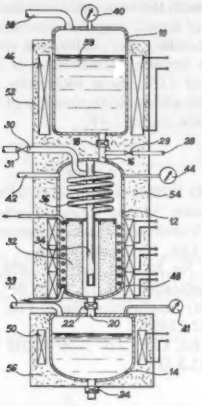
Claims priority, application France, Dec. 4, 1978, 78 34093

Int. Cl.³ B08B *3/08, 3/10*

U.S. Cl. 134—19 **4 Claims**

1. A process for cleaning a cold trap incorporated into a circuit for a liquid metal or a mixture of liquid metals, whereby in said trap are deposited impurities consisting of the hydride and the oxide of the liquid metal or liquid metals in question, comprising the steps of introducing into the trap an alkali metal hydroxide in liquid state and in excess compared with solubil-

ity limits of the hydride and the oxide, then heating of the trap up to total transformation of the impurities into liquid phases



and draining off of the liquid phases contained in the trap said steps being carried out in the absence of water.

4,290,823

MANUFACTURE OF COPPER WIRE ROD

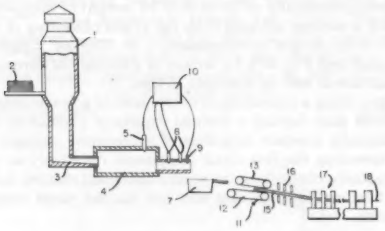
John Dompas, Olen, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 516,860, Oct. 22, 1974, abandoned. This application Oct. 25, 1979, Ser. No. 88,118

Claims priority, application Belgium, Oct. 22, 1973, 136901

Int. Cl.³ C22F *1/08*

U.S. Cl. 148—2 **2 Claims**



1. A method for the continuous production of copper wire rod comprising:

(a) melting copper cathodes to thereby establish a supply of liquid copper containing from 0.006 to 0.0095% by weight of oxygen,

(b) introducing said liquid copper into a holding zone wherein the liquid copper is heated by direct contact with hot combustion gases,

(c) continuously analyzing the oxygen content of the molten copper in the holding zone by means of electrochemical means,

(d) automatically regulating the ratio of combustible gas to oxygen fed to the burners associated with said holding zone in accordance with the continuous analysis set forth in step (c) so that the oxygen content of the liquid copper in the holding zone will be maintained within the range of 0.006 to 0.0095% by weight of oxygen,

(e) passing the liquid copper from said holding zone to a casting ladle, and then introducing liquid copper from said casting ladle, at a temperature of less than 1130° C. and having between 0.006 and 0.0095% by weight of oxygen, into a continuous casting machine having an inclined straight molding cavity formed by two endless metallic belts and two side dams, said molding cavity having a rectangular cross section in which the base of the rectangle is larger than 1.5 times the height of the rectangle,

(f) removing from said casting machine a continuous copper bar that has an oxygen content that is twice as much due to oxygen pick-up from the air during the passage of the copper from the casting ladle to the continuous casting machine, said copper bar comprising a shell of solid copper and a core of liquid copper,

(g) cooling the copper bar after removal from said casting machine by repeated and direct contact with a cooling agent so as to completely solidify the copper bar,

(h) passing the solidified copper bar from step (g) through a horizontal rolling mill along a curved path having a maximum curvature of less than 0.25 m^{-1}, and

(i) recovering a wire rod having good ductility, an elongation higher than 40%, an SP number higher than 300, and the annealing capacity of tough pitch copper, the cross section of said wire rod being less than 1/70th the cross section of the cross section of the copper bar removed from step (e).

4,290,824

WATER SOLUBLE ROSIN FLUX

Hugh F. Cole, Carrollton, Tex., assignor to Cobar Resources, Inc., Dallas, Tex.

Filed Dec. 10, 1979, Ser. No. 101,474

Int. Cl.³ B23K *35/34*

U.S. Cl. 148—23 **10 Claims**

1. A flux composition comprising: an activator in mix composition with a water soluble rosin derivative, proportioned by weight, respectively, one to a proportion in the approximate range of one-half to eighty, and a suitable diluent vehicle.

4,290,825

SEMICONDUCTOR DEVICES CONTAINING PROTONS AND DEUTERONS IMPLANTED REGIONS

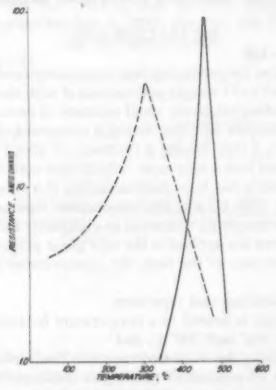
Geoffrey Dearnaley, Abingdon, England; Kenneth Steeples, Edinburgh, Scotland, and Ian J. Saunders, Morecambe, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 13, 1979, Ser. No. 11,959

Claims priority, application United Kingdom, Feb. 15, 1978, 5675/78

Int. Cl.³ H01L *21/265*

U.S. Cl. 148—33.4 **10 Claims**



9. A semiconductor device comprising a substrate body including regions of low resistivity separated by regions into

which protons and deuterons have been implanted to form substantially uniform layers of high resistivity and dimensions such as to isolate electrically the regions of the substrate of low resistivity.

4,290,826

PROCESS FOR THE PRODUCTION OF COBALT-RARE EARTH ALLOY POWDERS

Maurice A. Clegg, Fort Saskatchewan, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Sep. 30, 1980, Ser. No. 192,408

Claims priority, application United Kingdom, Oct. 12, 1979, 35544/79

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—101 **16 Claims**

1. A process for producing cobalt-rare earth alloy powders suitable for forming into permanent magnets, including providing cobalt powder particles having refractory oxide dispersoid powder particles fixed in the surfaces of the cobalt particles, providing particles of a rare earth element, mixing the cobalt-dispersoid particles with the rare earth particles in a proportion corresponding to the composition of the alloy to be formed, and heating the mixture to cause the cobalt-dispersoid particles and the rare earth particles to form the desired alloy by diffusion with substantially no sintering.

12. A process for producing cobalt-rare earth alloy powders suitable for forming into permanent magnets, including providing cobalt powder particles with a particle size in the range of from about 0.2 to about 5 micrometers and with refractory oxide dispersoid powder particles fixed in the surfaces of the cobalt particles, said refractory oxide dispersoid powder particles having a size in the range of from about 1 to about 20 nanometers, the proportion of dispersoid particles to cobalt particles being from about 0.5 to about 2% by weight of the cobalt particles, providing particles of a rare earth element having a size in the range of from about 5 to about 44 micrometers, mixing the cobalt-dispersoid particles with the rare earth particles in a proportion corresponding to the composition of the alloy to be formed, and heating the mixture to cause the cobalt-dispersoid particles and the rare earth particles to form the desired alloy by diffusion with substantially no sintering.

4,290,827

PROCESS FOR PRODUCING NI-FE MAGNETIC TAPE CORES

Friedrich Pfeifer, Bruchkoebel, and Wernfried Behnke, Rodenbach, both of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Apr. 4, 1979, Ser. No. 27,154

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814640

Int. Cl.³ C21D *1/04*

U.S. Cl. 148—108 **8 Claims**

1. In a process for producing tape cores composed of a Ni-Fe alloy having 45 to 53 weight percent nickel with the remainder iron and including relatively small amounts of deoxidizing and processing additives whereby an ingot composed of said alloy is worked into a tape having a thickness of about 0.01 to 0.1 mm and wound into a tape core, which tape core is then subjected to at least a one hour final annealing at a temperature of at least about 900° C. and the so-annealed tape core is then subjected to a tempering treatment in a magnetic field in which the lines of force are applied in the tape plane perpendicular to the rolling direction of the tape, the improvement comprising wherein:

(1) before winding said tape core,

(a) said tape is heated to a temperature between approximately 600° and 700° C. and

(b) subjecting the so-heated tape to a final deformation of at least 90 percent of said tape's thickness before said final deformation; and

(2) after winding said tape into a tape core, subjecting said core to a final annealing at a temperature ranging between about 1050° and 1200° C. so as to produce a secondary recrystallization structure within said tape.

7. A Ni-Fe magnetic tape core comprised of 45 to 53 weight percent nickel with the remainder iron and including relatively small amounts of deoxidizing and processing additives, characterized by a secondary recrystallization structure therein and a relatively high impulse permeability of about 8300 with an induction rise of 1.0T, about 6400 with an induction rise of 1.2T, about 4800 with an induction rise of 1.3T and about 2900 with an induction rise of 1.4T.

4,290,828

METHOD FOR MANUFACTURING BIMETAL

Tatsuyoshi Aisaka; Mitsuo Kawai; Fumio Mori, and Shinzo Sugai, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 880,301, Feb. 22, 1978, Pat. No. 4,207,381. This application Jul. 11, 1979, Ser. No. 56,689

Claims priority, application Japan, Feb. 23, 1977, 52-18082; Mar. 2, 1977, 52-21496

Int. Cl.³ C22F *1/00*; C21D *7/00*

U.S. Cl. 148—11.5 Q **19 Claims**

1. A method of manufacturing a bimetal exhibiting a hysteresis and a rapid deflection over a predetermined temperature range, comprising the steps of:

(a) providing a first metal component of a high expansion metal alloy whose thermal expansion coefficient rapidly changes from 21.5×10^{-6}/°C. or less to 50×10^{-6}/°C. or more at a temperature of between 100° C. and 250° C., said high expansion metal alloy being selected from a first alloy consisting of 15 to 30% by weight of manganese and substantially iron as the remainder or a second alloy consisting essentially of 15 to 30% by weight of manganese, and a member selected from the group consisting of 2 to 15% by weight of chromium, 2 to 15% by weight of cobalt and 2 to 20% by weight of a mixture of chromium and cobalt and the balancce of iron;

(b) providing a second metal component of a low expansion metal alloy having a thermal expansion coefficient substantially constant regardless of temperature changes;

(c) annealing the first metal component repeatedly to substantially eliminate work strains contained therein; and

(d) bonding together said first and second metal components.

4,290,829

PROCESS FOR BOX ANNEALING A STEEL STRIP COIL

Hiromichi Koshiishi; Kunio Mori; Hiroshi Sato, and Akira Sakaida, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 27, 1980, Ser. No. 153,673

Claims priority, application Japan, May 24, 1979, 54-64463

Int. Cl.³ C21D *9/52*

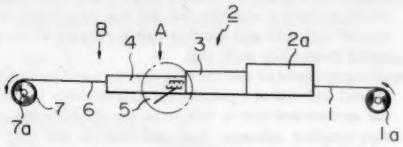
U.S. Cl. 148—130 **10 Claims**

1. A process for box annealing a steel strip coil, comprising the steps of:

pretreating a steel strip in such a manner that a side edge portion of said steel strip is subjected to a thermal treatment different from another thermal treatment to which the remaining portion, including an opposite side edge, of said steel strip is subjected, the difference between the thermal treatments applied to said side edge portion and said remaining portion causing the longitudinal length of said edge portion to become different from that of said remaining portion of said steel strip;

winding said pretreated steel strip under tension to form a

coil in such a manner that greater tensile stresses are created in either one of said side edge portion and said remaining portion, which one has a longitudinal length smaller than that of the other one, than those produced in the other one;



placing said coil on a base plate in such a manner that a side edge included in said portion having the greater stresses, of said steel strip, is brought into contact with said base plate, and;

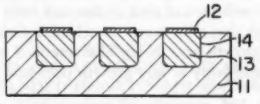
box annealing said coil on said base plate in a box annealing furnace.

4,290,830

METHOD OF SELECTIVELY DIFFUSING ALUMINIUM INTO A SILICON SEMICONDUCTOR SUBSTRATE

Yasuhiro Mochizuki; Sadao Okano, and Takuzo Ogawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 887,250, Mar. 16, 1978, abandoned. This application Oct. 16, 1979, Ser. No. 85,234
Claims priority, application Japan, Mar. 25, 1977, 52/33095
Int. Cl.³ H01L *21/225*
U.S. Cl. 148—187 **8 Claims**



1. A method of selectively diffusing aluminium into a single crystal silicon semiconductor substrate for fabricating a semiconductor device comprising the steps of:

forming a diffusion source layer for aluminium diffusion into said substrate, said diffusion layer having a predetermined thickness, on at least one major surface of said crystal silicon semiconductor substrate in a predetermined pattern; and

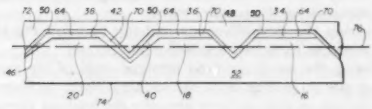
thermally treating said silicon semiconductor substrate having the diffusion source layer thereon to selectively diffuse aluminium into said substrate, said thermally treating step comprising: (a) a first step of subjecting said crystal silicon semiconductor substrate having said diffusion source layer thereon to oxidation by exposing said substrate to an atmosphere of oxygen, and (b) a subsequent second step of exposing said substrate to a non-oxidizing atmosphere, whereby aluminium is selectively diffused into said substrate without formation of cristobalite.

4,290,831

METHOD OF FABRICATING SURFACE CONTACTS FOR BURIED LAYER INTO DIELECTRIC ISOLATED ISLANDS

Kenneth A. Ports, Indialantic, and William G. Lucas, Indian Harbour Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 18, 1980, Ser. No. 141,504
Int. Cl.³ H01L *21/22*
U.S. Cl. 148—187 **6 Claims**



1. A method of fabricating an integrated circuit having a plurality of dielectrically isolated islands comprising:

etching a first surface of a substrate to form preselected portions of an isolation moat structure of preselected to be formed substrate islands using a first mask exposing said preselected portions;

non-selectively introducing impurities into said first surface and said preselected portions of said moat to form a low resistive region along said first surface and along said preselected portions of said moat;

etching said first surface to form a uniform isolation moat structure using a mask exposing the total isolation moat structure including said preselected portions;

forming a dielectric layer along said first surface and said moat structure;

covering said dielectric layer with material which over fills said moat and forms a support structure;

reducing the thickness of said substrate from a second surface opposite said first surface sufficiently to expose portions of said support structure in said moat and form isolated substrate islands; and

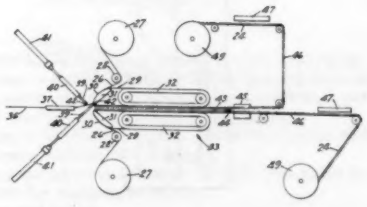
forming devices in said second surface of said substrate islands, said low resistive regions along said preselected island's wall forming a low resistive path to the buried low resistive region at said first surface of said preselected islands.

4,290,832

METHOD FOR MAKING FASTENERS

Melvin O. Kalleberg, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 714,132, Aug. 13, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,174
Int. Cl.² B32B *31/00*
U.S. Cl. 156—72 **5 Claims**



1. A method for forming a strip material useful as part of a fastener, said method comprising the steps of:

moving two backing layers from generally opposite directions around parallel arcuate spaced guides and away from the guides in the same direction along parallel paths;

feeding spaced parallel flexible, resilient polymeric monofilaments between the spaced guides from the sides thereof opposite said parallel paths;

alternately pressing U-shaped lengths of the flexible monofilaments into engagement with one of the backing layers and then pressing U-shaped lengths of the monofilaments spaced therefrom into engagement with the other backing layer while bonding the U-shaped lengths of the monofilaments to the backing layers in the positions that they are pressed into engagement therewith so that lengths of the monofilaments between the U-shaped lengths extend generally normally between the backing layers as the layers move along the parallel paths;

severing the monofilaments midway between the backing layers to form two brush-like halves; and

heating the newly severed terminal ends of the monofilaments projecting from the backing layers to form heads having arcuate surfaces opposite the backing layers;

said feeding step including the step of varying the positions of said monofilaments transversely of said parallel paths so that successive rows of U-shaped lengths of the monofilaments along the backing layers will not be aligned longitudinally of the backing layers.

4,290,833

METHOD FOR SEALING CATION EXCHANGE MEMBRANES OF CARBOXYLIC ACID TYPE FLUORINATED POLYMERS

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 28, 1979, Ser. No. 79,678
Int. Cl.[3] B29C *27/08;* B32B *31/20*
U.S. Cl. 156—94 **8 Claims**

1. A method for repairing portions of cation exchange membranes comprised of a fluorinated polymer having carboxylic acid type functional groups, said method which comprises:

(a) esterifying said portions to provide carboxylic acid type functional groups in the ester form,

(b) contacting portions of said membrane in said ester form to be repaired, and

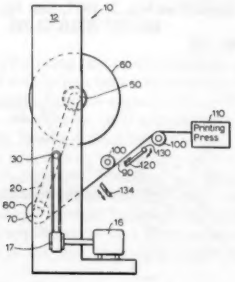
(c) ultrasonically sealing said portions.

4,290,834

WEB SPLICING METHOD

Paul M. Buettel, 86 Longfellow Dr., Colonia, N.J. 07067

Continuation of Ser. No. 43,899, May 30, 1979, abandoned, which is a continuation of Ser. No. 871,441, Jan. 23, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,309
Int. Cl.[3] B65H *19/18*
U.S. Cl. 156—157 **2 Claims**



1. The method of splicing a new web to an old web comprising the steps of

transporting a first running web which is free of adhesive means adjacent the trailing edge portion from a first web roll to a printing press at a selected speed,

applying strips of double-sided, pressure-sensitive adhesive tape, having differential pressure-adhering characteristics, to the leading edge of a second web of a second new web roll,

bringing said second new web roll into contact with said first web, with said first web making contact with, but not adhering to, said strips of double-sided, pressure-sensitive adhesive tape, whereby said second web roll is caused to rotate at such a velocity that the line of contact of the second web roll with the first web is moving at the same speed as said first web, and

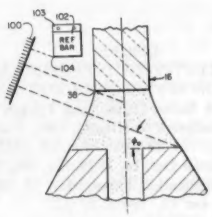
applying pressure to said running first web and said rotating second web roll at a preselected time to cause the web of the second web roll to adhere to the double-sided, pressure-sensitive adhesive tape and thus to the first web whereby said second web is transported to said printing press.

4,290,835

METHOD FOR CRYSTAL GROWTH CONTROL

Douglas A. Yates, Burlington; Arthur E. Hatch, Waltham, and Jeff M. Goldsmith, Medford, all of Mass., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Division of Ser. No. 915,443, Jun. 14, 1978. This application Jun. 19, 1980, Ser. No. 161,037
Int. Cl.[3] C30B *15/26*
U.S. Cl. 156—601 **3 Claims**



1. A method of growing a crystalline body of selected material from a growth pool of melt so that said body has a selected cross-sectional shape for some preselected distance along its length, said growth pool being characterized by a meniscus which joins said body at said growth pool said method comprising:

positioning reference object means adjacent the junction where said meniscus meets said body;

observing said body, said reference object means and said meniscus along an optical axis which is substantially perpendicular to the surface of said meniscus where said meniscus meets said body and in which the reference object means appears spaced from the junction with a portion of said meniscus or said body spaced therebetween;

determining a first spatial position where a sharp contrast occurs between said body, and said meniscus and a second spatial position where a sharp contrast occurs between said portion of meniscus or body and said reference object means;

referencing said first spatial position relative to said second spatial position; and

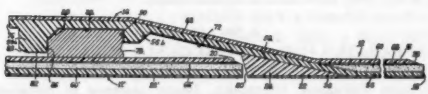
controlling the speed at which said body is pulled from said growth pool or the temperature of said growth pool so that said first spatial position can be controlled relative to said second spatial position.

4,290,836

METHOD OF MAKING COMPOSITE PIPE HAVING AN INTEGRAL BELL END

Alex L. McPherson, Winfield, Ill.; Douglas E. Triestram, and James E. Lawrence, Jr., both of Coshocton, Ohio, assignors to Clow Corporation, Oak Brook, Ill.

Division of Ser. No. 879,158, Feb. 21, 1978, Pat. No. 4,240,470.
This application Apr. 7, 1980, Ser. No. 138,160
Int. Cl.[3] B65H *81/00*
U.S. Cl. 156—171 6 Claims



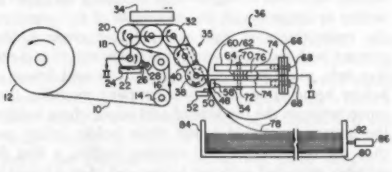
1. A method of making a composite reinforced plastic pipe having a generally cylindrical tubular portion defining a spigot end and an opposite integral bell end adapted to receive the spigot end of a similarly configured pipe therein; said method comprising the steps of forming an annular inner liner or resin impregnated surfacing veil defining an axial passage having a first tubular portion of substantially uniform cylindrical cross section, forming an annular butting area circumferentially of said inner liner adjacent said bell end so as to define an annular surface for abutment with the spigot end of a mating pipe inserted into said bell end, forming an inner layer circumferentially of said inner liner by winding a resin impregnated continuous fiberglass roving helically on the outer surface of said inner liner and continuing said inner layer axially beyond one end of said inner liner and said butting area to form a second tubular portion defining said bell end, said inner layer defining an internal annular seal receiving groove in said bell end, forming a core layer of sand-resin composition circumferentially about and directly on the outer peripheral surface of said inner layer, said core layer being of substantially uniform cross section and formed along the length of said first tubular portion but terminating at said bell end so as not to form a part of said bell end, said sand-resin composition having a sand to resin weight ratio in the range of approximately 80:20 to 70:30, forming an outer layer of a plurality of lays of resin impregnated continuous fiberglass roving circumferentially about said core layer and the exposed surface of said inner layer so as to cooperate with said inner layer in defining said bell end, and curing the resulting composite pipe to effect bonding between the various layers.

4,290,837

METHOD AND APPARATUS FOR MAKING UNEXPANDED HONEYCOMB MATERIAL

Joseph D. Bova, 2104 Harford Rd., Fallston, Md. 21047

Filed Dec. 28, 1979, Ser. No. 108,009
Int. Cl.[3] B32B *31/00, 3/12*
U.S. Cl. 156—256 20 Claims



1. A method of forming a stack of unexpanded honeycomb core sheets from a continuous web of sheet material of which alternate ones of said sheets in said stack have linearly spaced and transversely extending lines of adhesive on one side thereof spaced equally between similar adhesive lines on the others of said sheets when stacked in even edge alignment, comprising the steps of: applying linearly spaced and transversely extending lines of adhesive to at least one face of said web by contacting said web with a printing roll having spaced lines of adhesive thereon; cutting said web parallel to said lines of adhesive and each succeeding cut being made a set distance from each other; said cutting being made by a rotary cutting roll, having a transversely extending cutting blade thereon, rotating once for a given number plus one-half revolutions of said printing roll for cutting said web along a linear center of a line of said adhesive on said web and on a succeeding rotation of said cutting roll, cutting said web between linearly spaced lines of adhesive on said web.

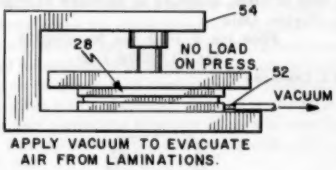
8. Apparatus for making a stack of unexpanded honeycomb core sheets from a continuous web comprising: a printing means including a gravure roll having an odd number of gravure lines spaced equally around the circumference of said roll for applying transversely extending lines of adhesive at linearly spaced intervals along the length of said web on one side thereof; a cutting means downstream from said printing means including a cutting roll with a transversely extending cutting blade thereon, said cutting roll having a cutting circumference equal to the length of the sheets to be cut from said web, such circumference also being equal to a given number plus one-half of the circumference of said gravure roll; a web pulling means between said printing means and said cutting means for pulling said web past such gravure roll and controlling the advance of said web past said cutting means; and a drive means linking said cutting means with such printing means for rotating said cutting roll once for each of a given number plus one-half revolutions of said gravure roll to cut said web transversely along the linear center of a line of said adhesive on said web during one revolution of said cutting roll and along the linear center of a space between said lines of adhesive on a succeeding revolution of said cutting roll.

4,290,838

METHOD FOR VACUUM LAMINATION OF FLEX CIRCUITS

Joseph A. Reavill, Mira Loma, and John M. Arachi, Riverside, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Division of Ser. No. 965,976, Dec. 4, 1978, Pat. No. 4,234,373.
This application Aug. 17, 1979, Ser. No. 67,254
Int. Cl.[3] B29C *17/00;* B32B *31/00*
U.S. Cl. 156—286 5 Claims

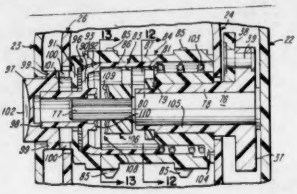


1. A method of laminating printed circuits comprising:
selecting a sealable press fixture having opposed plates defining upper and lower planar faces and including a peripheral band seal extending between the plates;
forming a laminate of flexible sheets of circuits with an adhesive between said sheets;
placing the laminate of circuits between said plates in said fixture for engagement thereby;
closing said fixture;
applying a vacuum in the fixture for drawing air from between said sheets of circuit while supporting the face of said upper plate out of engagement with said laminate;
maintaining the vacuum for predetermined period of time; and
applying pressure to the press fixture for forcing the laminate to bond together.

4,290,839
LABEL PRINTING AND APPLYING APPARATUS

Robert M. Pabodie, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 9, 1980, Ser. No. 110,720
Int. Cl.[3] B65C *11/02*
U.S. Cl. 156—384 7 Claims

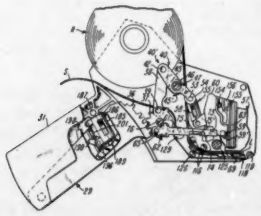


1. In a hand-held apparatus for printing and applying pressure sensitive labels releasably carried on a web of supporting material, comprising: a frame having a handle, an actuator disposed at the handle, means for printing on the labels, means for delaminating printed labels, means for applying printed labels, a toothed feed wheel engageable with the web, means coupled to the actuator for moving the printing means to print on a label and for moving the labels stepwise into registration with the printing means, the moving means including a pawl and ratchet mechanism, the pawl and ratchet mechanism having a ratchet wheel and a cooperable pawl, and means for varying the position to which the label is advanced into registration with the printing means, the improvement in the position varying means comprising a clutch having a first clutch member coupled to the ratchet wheel and a second clutch member coupled to the feed wheel and cooperable with the first clutch member, a shiftable and rotatable member operating for moving the first clutch member out of clutching rotation with the second clutch member and for moving the feed wheel to change the positional relationship between the feed wheel and the ratchet wheel, and means for preventing rotation of the ratchet wheel and movement of the second clutch member in either direction when the clutch is disengaged.

4,290,840
LABEL PRINTING AND APPLYING APPARATUS

Robert M. Pabodie, Dayton, and Paul H. Hamisch, Jr., Franklin, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 9, 1980, Ser. No. 110,733
Int. Cl.[3] B32B *1/00*
U.S. Cl. 156—384 28 Claims

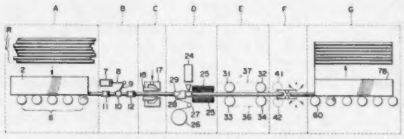


1. Hand-held apparatus for printing and applying pressure sensitive labels releasably carried on a web of supporting material, comprising: a frame having a handle, an actuator disposed at the handle and movable between an initial position and an actuated position, a platen, a print head, means mounting the print head for straight line movement into and out of printing cooperation with the platen, means disposed adjacent the platen for delaminating printed labels, means for applying the printed labels, means coupling the actuator and the print head, the coupling means including a link, a pivotally mounted lever having arms, means pivotally connecting the link and one arm of the lever, a spring device, means pivotally connecting another arm of the lever and the spring device, means for preventing movement of the print head toward the platen during a portion of the movement of the actuator from its initial position to its actuated position to load the spring device, and means effective when the actuator has moved through a predetermined distance for releasing the print head into printing cooperation with the platen.

4,290,841
APPARATUS FOR CONTINUOUSLY FORMING A COATING LAYER ON UNBONDED PC STEEL BARS

Tetsukazu Fukuhara, Hiratsuka, Japan, assignor to Neturen Company Ltd., Tokyo, Japan

Division of Ser. No. 974,513, Dec. 28, 1978. This application Aug. 7, 1979, Ser. No. 64,627
Claims priority, application Japan, May 19, 1978, 53/58874
Int. Cl.[3] B32B *31/00*
U.S. Cl. 156—464 3 Claims



1. A system for continuously coating unbonded PC steel bars moving along one after the other in an axial path, said system comprising:

an axial interval regulating device including first and second pairs of pinch rollers positioned upstream and downstream, respectively with respect to said axial path, a spacer movable between first and second specific points upstream and downstream, respectively of said upstream pair of pinch rollers along said axial path, means for separately moving said pinch rollers toward and away from said axial path, and means for moving said spacer back or forth between said first and second points;

a coating device including an outer nozzle, an inner nozzle positioned within said outer nozzle, said outer nozzle having therethrough a coating agent outflow path, and said inner nozzle being shiftable toward and away from said outer nozzle along said axial path to thereby block and clear said coating agent outflow path;

a taping device for applying tape around a plurality of said steel bars, thus axially joining said steel bars;

a transfer mechanism including a pair of symmetrical conveyor units vertically spaced from each other by a specified spacing on opposite sides of said axial path, each said unit including a chain belt stretched over spaced rotating bodies, each said conveyor unit including an upper chain holder in contact with the underside of the upper run of the respective said belt and a lower chain holder in contact with the inner side of the lower run of said respective belt, said upper chain holder and said lower chain holder being connected by a coupling member, the distance between the top side of said upper chain holder and the underside of said lower chain holder being greater than the diameter of said rotating bodies, a first fitting member provided adjacent to one end of said lower chain holder of the upper said conveyor unit, a second fitting member provided adjacent to the other end of said upper chain holder of the lower said conveyor unit, a first adjusting member connecting said first and second fitting members, a third fitting member provided adjacent to the other end of said lower chain holder of said upper conveyor unit, a fourth fitting member provided adjacent to one end

of said upper chain holder of said lower conveyor unit, a second adjusting member connecting said third and fourth fitting members, said first and second adjusting members intersecting in an X-fashion and being pivotally connected, said lower chain holder of said upper conveyor unit and said upper chain holder of said lower conveyor unit thus being interlocked so that they may be displaced toward and away from each other, and said chain holders being mounted to be elastically slightly displaceable from each other; and

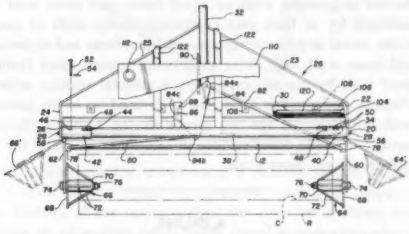
a cutting device including a pair of members symmetrically positioned on opposite sides of said axial path, each said member including a rotatable shaft, a rotatable arm having a first end fixed to said rotatable shaft, a fixed shaft, a swing arm having a first end coupled to said fixed shaft, a parallel member connected to second ends of said swing arm and said rotatable arm, and a cutter located substantially at the midpoint of said parallel member, said cutter including a heater, and the arrangement being such that by simultaneous opposite rotation of said rotatable arms of said two members, hollow tubular taped portions between adjacent said steel bars can be thermally severed by contact of said heaters of said two members.

4,290,842

FELT PAPER ROLLER ASSEMBLY

Wilburn K. Gable, 4203 Mt. Ranier St., Dallas, Tex. 75211

Filed Jan. 24, 1980, Ser. No. 115,071
Int. Cl.[3] B44C *7/06;* **E04D** *15/06*
U.S. Cl. 156—577 **4 Claims**



1. A roller assembly for dispensing and applying felt paper comprising:

(a) a cylindrically shaped roller having a smooth, uninterrupted surface;

(b) a shaft journaled through said roller and extending outwardly therefrom to form an axle;

(c) frame means having a pair of legs joined by a connecting member with said shaft rotatably secured between said legs;

(d) handle means secured to said connecting member and extending upwardly therefrom;

(e) hand grips secured to said handle means;

(f) a pair of substantially conically shaped support rollers;

(g) means moveably supporting said support rollers in opposed positions on opposite sides of said frame means;

(h) control means for moving said support rollers from a first outer position to a second position wherein said support rollers engage the central hollow portion of a roll of felt paper and support said roll of felt paper between said support rollers;

(i) crank means pivotably secured to said frame means;

(j) connecting rods secured between said means moveably supporting said support rollers and said crank means to move said support rollers when said crank means is moved; and

(k) means for moving said crank means.

4,290,843

EPITAXIAL GROWTH OF MAGNETIC MEMORY FILM ON IMPLANTED SUBSTRATE

Ralph Korenstein, Plano, and Carlos A. Castro, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1980, Ser. No. 122,550
Int. Cl.[3] B44C *1/22*
U.S. Cl. 156—628 **9 Claims**

1. A method for fabricating a magnetic memory film comprising the steps of:

depositing an ion mask on the surface of a crystalline substrate, and thereafter ion implanting said surface for the purpose of damaging the portion thereof exposed by the ion mask to the limited extent necessary to prevent monocrystalline growth upon said exposed portion;

growing an epitaxial layer of magnetizable material having a similar crystalline structure on the surface of said substrate, the layer having a polycrystalline structure where grown over the ion damaged areas and monocrystalline structure elsewhere;

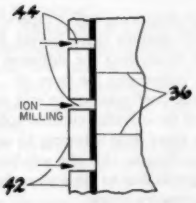
selectively removing the polycrystalline portions of the epitaxial layer.

4,290,844

FOCAL PLANE PHOTO-DETECTOR MOSAIC ARRAY FABRICATION

Ralph A. Rotolante, Acton, and Toivo Koehler, Lexington, both of Mass., assignors to Carson Alexiou Corporation, Costa Mesa, Calif.

Filed Feb. 26, 1979, Ser. No. 15,070
Int. Cl.[3] H01L *21/302*
U.S. Cl. 156—630 **19 Claims**



1. A method for providing a mosaic of individual photodetector elements on the focal plane of a support structure having a multiplicity of individual electrical conductors buried within it and terminating in separate electrical contact points at its focal plane, which method comprises the following steps:

securing a thin wafer of detector material to the focal plane face of said supporting structure in such a way that the wafer material is in electrical contact with said contact points; and

thereafter delineating individual detector islands by removing material from the wafer to form channels located between the electrical contact points and dividing the wafer into a multiplicity of individual detector islands adapted to provide detector elements each of which is isolated from all the others and each of which is directly over and in electrical contact with a separate one of said contact points.

19. A method for providing a focal plane mosaic of photodetector elements on a supporting structure comprising:

applying a layer of electrically-conducting epoxy to the focal plane;

placing a wafer of mercury cadmium telluride on the epoxy;

applying a titanium oxide mask on the exposed side of the wafer for the purpose of protecting individual islands of mercury cadmium telluride material; and

using an ion milling process to remove both detector mate-

rial and epoxy material from the unprotected spaces between the islands of mercury cadmium telluride material.

4,290,845

PROCESS FOR THE PRODUCTION OF HIGH TEMPERATURE-RESISTANT METALLIC COMPONENTS WITH FINELY POROUS WALLS

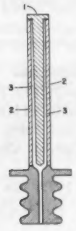
Wolfgang Betz, Munich, and Axel Rossmann, Karlsfeld, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen Union, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,847

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911714

Int. Cl.[3] C23F *1/02*

U.S. Cl. 156—644 8 Claims



1. A process for producing high temperature-resistant metallic components of complex shape having finely porous walls, particularly such facilitating the diffusion therethrough of a cooling medium, comprising the steps of:

(a) imparting the configuration to said component from an alloy adapted for oriented eutectic solidification;

(b) effecting a short-term sintering to said component and controlled cooling so that the solidification propagation extends perpendicular to the wall surfaces, including wall surfaces of complex shape;

(c) and etching out formed needles or rods from the solidified component.

4,290,846

METHOD OF PROTECTING ORGANIC OR INORGANIC MATERIAL FROM ATTACK BY MICROORGANISMS

Rene Muntwyler, Hofstetten, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 30, 1979, Ser. No. 62,193

Claims priority, application Switzerland, Aug. 8, 1978, 8472/78

Int. Cl.[3] D21D *3/00*

U.S. Cl. 162—161 12 Claims

1. A method of protecting organic and inorganic material from attack by micro-organisms, which comprises incorporating in or applying to the surface of said material 3,5-dibromo-4-chlorophenol, 3,5-dibromo-4-fluorophenol or 3,5-dichloro-4-bromophenol or a mixture thereof, an amount of about 100 to 10,000 ppm based on the material to be protected.

4. A method according to claim 1 for protecting paper-making slurries and machines used in the paper industry from the formation of slime induced by microorganisms.

4,290,847

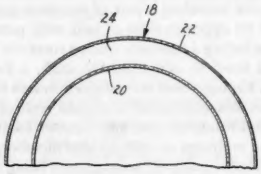
MULTISHELL MICROCAPSULES

James R. Johnson, White Bear Lake, and William C. Flanagan, Jr., Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 10, 1975, Ser. No. 630,311

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—1 11 Claims



1. In an apparatus comprising means for extracting useful energy in a controlled manner from a microcapsule giving off useful energy in a controlled manner when imploded by an energy beam, said microcapsule having a free-flowing, rigid substantially spherical configuration ranging in diameter between 1 and 2,000 micrometers, comprising at least one nonporous inner wall of substantially uniform thickness consisting of homogeneous, non-vitreous, ceramic metal oxide in polycrystalline state having therein a single cavity containing a preselected radioactive composition consisting of the group including deuterium and tritium and mixtures and compounds thereof in gaseous, solid or liquid form, said inner wall being enclosed by at least one concentric outer shell of ceramic oxide, metal or pyrocarbon spaced apart from and surrounding said inner wall, said outer shell being spaced apart from said inner wall by means comprising a skeletal residue structure, wherein said residue structure is formed so as to provide a randomly oriented spacing means having portions thereof in contact with the other surface of said inner wall and the inner surface of said outer shell.

4,290,848

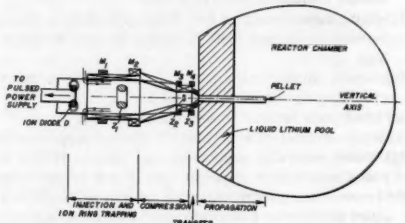
ION-RING IGNITOR FOR INERTIAL FUSION

Ravindra N. Sudan, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Aug. 25, 1978, Ser. No. 936,959

Int. Cl.[3] G21B *1/00*

U.S. Cl. 176—5 14 Claims



1. In a system comprising means for extracting useful energy in a controlled manner from a target imploded by an energy beam, said target giving off useful energy in a controlled manner when imploded by said beam,

a reactor chamber;

a target fuel pellet mounted within said reactor chamber;

means for producing an annular ring of ions;

means to compress said ring of ions to increase its energy and decrease its size; and

means including a guide tube for transporting said ring of ions to impact said target pellet within said reactor chamber for the purpose of initiating a fusion reaction in the pellet by energy transfer from said ions to said pellet.

4,290,849

NUCLEAR REACTOR

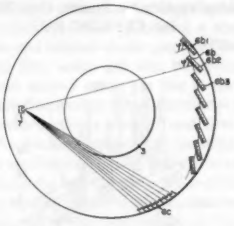
Nobuo Uesugi, Yokohama; Tatsuo Miyazawa, Higashi; Mituaki Furudate; Keiichi Sasaki, both of Yokohama, and Hiroji Mizuguchi, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1978, Ser. No. 953,274

Claims priority, application Japan, Oct. 26, 1977, 52-127578

Int. Cl.³ G21C *17/00*

U.S. Cl. 176—19 R **7 Claims**



1. A nuclear reactor, comprising a reactor vessel, a core housed in the reactor vessel, an ultrasonic transducer mounted in the vicinity of the upper end of the core for emitting and receiving an ultrasonic wave pulse signal propagating above the core, means for rotating the transducer by a prescribed angle to scan horizontally the ultrasonic wave emitted from the transducer, a plurality of reflective members mounted in the vicinity of the upper end of the core in a manner to face the transducer for reflecting the ultrasonic wave signal emitted from the transducer, means for energizing the transducer, and means for displaying the ultrasonic wave signal reflected by the reflective members and received by the transducer in synchronism with the wave scanning motion of the transducer, wherein each of the reflective members is provided with a number of reflective surfaces arranged in the scanning direction of the ultrasonic wave and shaped to permit the incident ultrasonic wave to be reflected a plurality of times such that the reflected wave returning to the transducer runs along a path parallel with and differing from the path of the incident wave, and the reflective surfaces differ from each other in distance from the transducer so as to prevent interference among the reflected ultrasonic wave signals; wherein the difference (Δl) in round trip distance from the transducer between two adjacent reflective surfaces meets the following relationship:

$$\Delta l > c\tau$$

where,

c . . . speed of sound

τ . . . pulse width of the ultrasonic wave.

4,290,850

METHOD AND APPARATUS FOR CONTROLLING FEEDWATER FLOW TO STEAM GENERATING DEVICE

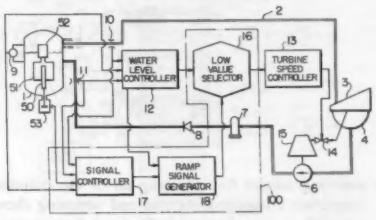
Takashi Omori, Kitaibaraki, and Takao Sato, Tokaimura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1979, Ser. No. 70,819

Claims priority, application Japan, Sep. 1, 1978, 53-106260; Feb. 26, 1979, 54-20835

Int. Cl.³ G21C *7/00*

U.S. Cl. 176—20 R **4 Claims**



1. A method of controlling feedwater flow to a nuclear steam generating device in a tripped condition of the steam generating device, comprising the steps of:

(a) arithmetically calculating a first forecast length of time required for the water level in the steam generating device to attain its desired normal operation level on the basis of the detected water level and the rate of variation of the water level when said detected water level in the steam generating device is lower than said desired normal operation level, the detected flow rate of feedwater is larger than that of the main steam, and said rate of variation of the water level is positive;

(b) arithmetically calculating a second forecast length of time required for the flow rate of feedwater to decrease to a predetermined flow rate on the basis of the detected feedwater flow rate, the detected main steam flow rate and a substantially constant rate of variation of the flow rate of feedwater;

(c) decreasing the level of the output signal of ramp signal generator means at a rate of variation corresponding to said substantially constant rate of feedwater flow rate variation when the time difference obtained by subtracting $\frac{1}{3}$ of said second forecast length of time from said first forecast length of time becomes zero or negative; and

(d) selecting either the output signal of said water level controller means for generating a control output signal on the basis of various input signals applied thereto including an input signal indicative of the flow rate of main steam, and input signal indicative of the flow rate of feedwater, and an input signal indicative of water level in the steam generating device or the output signal of the ramp signal generator means, which has a lower value than the other to deliver it as the feedwater flow rate demand signal.

4,290,851

NUCLEAR REACTOR SAFETY SYSTEM

Russell M. Ball, Euclid, Ohio, and Robert C. Roberts, Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 29, 1979, Ser. No. 7,077

Int. Cl.³ G21C *7/00*

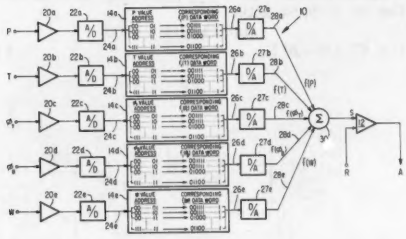
U.S. Cl. 176—24 **9 Claims**

1. A safety system for a nuclear reactor comprising:

a series of transducers for measuring various different parameters of the nuclear reactor's operation;

a series of parallel-connected computer-type look-up tables each individually connected to each one of the transducers, each look-up table containing a precalculated function of that parameter measured by said transducer connected

to that look-up table indicative of percentage of full reactor load contributed by that parameter for a series of measured parameter values and outputing said precalculated function in response to the parameter signal measured by said transducer connected thereto;



a summing station for receiving all of the outputs of the respective computing stations and summing them up to establish a control signal indicative of percentage of allowable full power reactor operation.

4,290,852

ROOF REFLECTOR FOR A GAS-COOLED PEBBLE-BED REACTOR AND PROCESS FOR THE DISASSEMBLY OF THE ROOF REFLECTOR

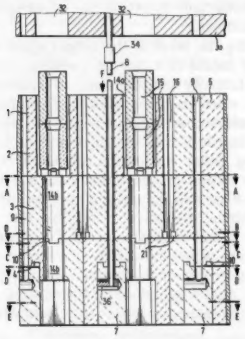
Rolf Fritz, Oftersheim; Bernhard Kalden, Leimen, and Karl-Friedrich Kissel, Hemsbach, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,434

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817540

Int. Cl.³ G21C *11/06*

U.S. Cl. 176—58 PB **11 Claims**



1. In a gas-cooled pebble-bed reactor having a thermal cover shield, a roof reflector for suspension from said thermal cover shield, comprising:

a plurality of graphite blocks of essentially hexagonal cross-section grouped in a plurality of layers superposed such that blocks in adjacent said superposed layers are aligned to form plural adjacent columns;

a group of three adjacent said columns comprising a supportable unit with three said blocks forming a lowermost layer of said unit, each said block being associated with only one said unit;

a support block for supporting each said unit, each said support block arranged beneath at least a portion of said blocks forming a lowermost layer of a respective unit to be supported; and

a respective hanger bolt for releasably fastening each said support block to said thermal cover shield,

each said unit having an opening through which a said hanger bolt passes from a said support block to sad thermal cover shield, said blocks forming said lowermost layer of each said unit having lower means for interlocking with a respective said support block and upper means for interlocking with blocks in a said layer superposed on said lowermost layer, and each said unit having a sidewall portion shaped such that a group of three abutting said units defines a passage for receiving an absorber rod, each said unit being associated with only one said passage.

4,290,853

PROTECTION OF STEAM PIPING IN A NUCLEAR REACTOR

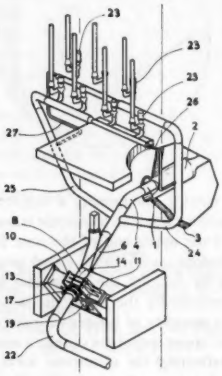
Roger Gigou, Herblay, France, assignor to Framatome, Courbevoie, France

Filed Oct. 16, 1978, Ser. No. 952,588

Claims priority, application France, Oct. 21, 1977, 77 31705

Int. Cl.³ G21C *5/12*

U.S. Cl. 176—87 **2 Claims**



1. An assembly for protecting a portion of steam piping in a nuclear reactor downstream of the leaktight passage of said piping through the confinement chamber wall of said reactor, said piping comprising a first portion extending from said passage in a mean radial plane of said passage and connected by a bend to a second portion extending in a direction substantially perpendicular to said radial plane, and a stopcock connected in said first piping portion, said assembly comprising a support fixed to said confinement chamber wall; guide means fixed to said support and having a pair of plane guide surfaces extending parallel to said radial plane and symmetrical relative thereto; guide element means fixed to said first piping portion between said bend and said stopcock and slidable on said guide surfaces; connecting rod means including shock absorbing means connected to said support and arranged symmetrically relative to said radial plane, said shock absorbing means compensating for deleterious forces exerted on the stopcock and connecting means fixed to said first piping portion between said bend and said stopcock and connected to said connecting rod means.

4,290,854
METHOD OF OPERATING HORIZONTAL COKE OVEN BATTERIES

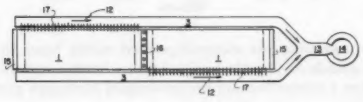
Manfred Strobel, and Friedrich, both of Thiersch, Recklinghausen, Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Division of Ser. No. 967,612, Dec. 8, 1978, Pat. No. 4,256,540, which is a continuation-in-part of Ser. No. 853,817, Nov. 21, 1977, abandoned. This application Dec. 13, 1979, Ser. No. 103,232

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654555

Int. Cl.³ C10B *21/10*

U.S. Cl. 201—26 **1 Claim**



1. A method of operating a horizontal coke oven battery having a pusher side and a coke side with a plurality of coke ovens disposed in a row with a first waste gas flue extending along the pusher side and a second waste gas flue extending along the battery side, the coke oven battery having a center head in approximately the longitudinal middle of said row of coke ovens, the coke oven battery having a stack flue connected to said first and second waste gas flues, the cross-sectional area of said first waste gas flue being approximately equal to that of said second waste gas flue in the area of said stack flue, said stack flue having a cross-sectional area equal to the sum of the cross-sectional area of said first and second waste gas flues; the method comprising the steps of directing heating gases into approximately one half of the coke ovens in the coke oven battery for heating the coke oven by an upward gas flow, directng heating gases into the remaining coke ovens for heating the coke ovens by a downward gas flow, collecting the gases to be exhausted from said approximately one-half of said coke oven gases in one of said first and second waste flues to form approximately one half of the total gas flow to said stack flue, collecting waste gases from the remainder of said coke ovens in the other of said first and second waste gas flues, the coke ovens on one side of said center head being heated by said upward gas flow and the coke ovens on the other side of said center head being heated by said downward gas flow, the final total gas flow supplied in said first waste gas flue in the area of said stack flue being equal to the final total gas flow supplied in said second waste gas flue in the area of said stack flue, said stack flue having a gas flow supplied thereto of approximately twice that of said first and second waste gas flues.

4,290,855
METHOD OF ISOTOPE ENRICHMENT

Patrick H. O'Farrell, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 31, 1979, Ser. No. 108,778

Int. Cl.³ C25C *1/22*; C25B *7/00*; B01D *13/00*

U.S. Cl. 204—1.5 **18 Claims**

1. A method for separating in a separation chamber having longitudinally varying separation characteristics at least one isotope from a mixture of isotopic species in which the isotopic species exist as ions and comprising the steps of:

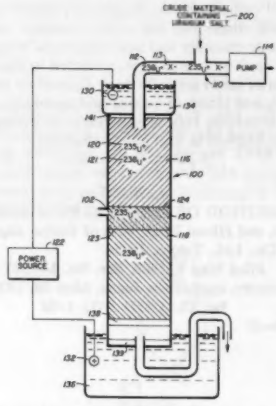
introducing said mixture into said chamber;

imparting said species with a movement in a first direction by flowing a carrier fluid through said chamber; and

applying an electric field across said chamber to electrophorese said species in a second direction counter to said first direction to segregate each of said species in an equilibrium zone within the chamber.

14. An apparatus for segregating at least one species of ions, said apparatus comprising:

means for producing longitudinally varying separation characteristics within a separation chamber;



means for imparting movement to said ions in a first longitudinal direction within the chamber; and

means for electrophoresing said ions in a second direction counter to said first direction to segregate said species into equilibrium zones within the chamber.

4,290,856
ELECTROPLATING APPARATUS AND METHOD

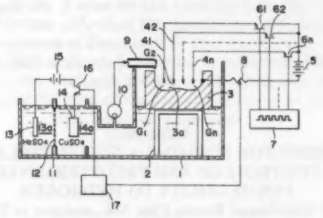
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Filed Jan. 24, 1980, Ser. No. 115,119

Claims priority, application Japan, Jan. 25, 1979, 54-7897

Int. Cl.³ C25D *1/10, 21/12, 21/18*

U.S. Cl. 204—4 **3 Claims**



1. An electroforming apparatus comprising:

a mold;

at least one electrode juxtaposed with said mold to form an electrodeposition gap therebetween;

a receptacle for an electroforming electrolyte containing a metal to be electrodeposited upon said mold;

pumping means for circulating said electrolyte through said electrodeposition gap to supply the latter with said electrolyte;

an electroforming power supply connected across said mold and said electrode for passing an electrodeposition current through said gap supplied with said electroforming electrolyte to electrolytically deposit said metal from said electrolyte;

electrolyzer means for electrolytically replenishing said metal in the electrolyte in said receptacle, said electrolyzer means including:

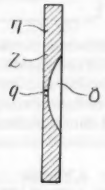
an anode composed of said metal;
an anode chamber defining the region of said anode;
an ion-exchange membrane separating the region of a cathode of said electrolyzer means from said anode chamber;
an electrolyzing power supply connected across said anode and said cathode for electrolytically dissolving said metal from said anode into said anode chamber; and
said anode chamber and said receptacle being contiguous with each other and interconnected to allow free circulation of said electroforming electrolyte between them and introduction of ions of said metal into said electrolyte in said receptacle at a rate proportional to the rate of electrolysis in said anode chamber.

4,290,857

METHOD OF FORMING FINE BORE

Kunio Ikeda, and Hirosi Haga, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,131
Claims priority, application Japan, May 30, 1979, 54/67067
Int. Cl.³ C25D *1/02, 1/08*
U.S. Cl. 204—9 **10 Claims**



1. A method of forming a fine bore ink head comprising the steps of:
effecting electro-forming on a core wire having the same diameter as that of a fine bore to be formed to form an electro-formed layer around said core wire to thereby make an electro-formed rod having said core wire at its center;
slicing said electroformed rod to form a plurality of disc-shaped chips containing said core wire; and
removing said core wire by dissolution or heating to thereby form in said chips a fine bore of the same diameter as said core wire and to form said ink head.

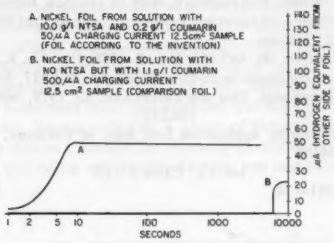
4,290,858

PROCESS FOR FORMING A NICKEL FOIL WITH CONTROLLED AND PREDETERMINED PERMEABILITY TO HYDROGEN

Darell E. Engelhaupt, Kansas City, Mo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 23, 1980, Ser. No. 189,991
Int. Cl.³ C25D *1/04, 3/12*
U.S. Cl. 204—12 **11 Claims**

1. A process for forming a nickel foil having a controlled and predetermined hydrogen permeability, said process comprising the steps of
(a) passing a nickel plating bath through a copper and gold cation-removing cation exchange resin, whereby there is provided a purified nickel plating bath free of copper and gold cations;
(b) immersing a readily-corrodible nickel anode and a cathode in said purified bath comprising a selected concentration of an organic sulfonic acid; said cathode being suitable for electrodeposition of nickel thereon and being separable from an electrodeposited nickel layer;
(c) electrodepositing a nickel layer having the thickness of a foil directly onto said cathode, while maintaining the cathode current density and bath temperature at selected values; and


A. NICKEL FOIL FROM SOLUTION WITH 10.0 g/l NTSA AND 0.2 g/l COUMARIN 50 mA CHARGING CURRENT 12.5cm² SAMPLE (FOIL ACCORDING TO THE INVENTION)
B. NICKEL FOIL FROM SOLUTION WITH NO NTSA BUT WITH 1.1 g/l COUMARIN 500 mA CHARGING CURRENT 12.5 cm² SAMPLE (COMPARISON FOIL.)
μA (HYDROGEN EQUIVALENT FROM OTHER SIDE OF FOIL)
SECONDS
A
B

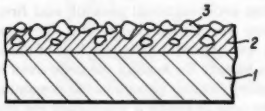
(d) separating the electrodeposited nickel layer from said cathode to provide a nickel foil; whereby said nickel foil has a controlled and predetermined hydrogen permeability.

4,290,859

PROCESS FOR PREPARING ELECTRODE

Yoshio Oda; Hiroshi Otouma, and Eiji Endoh, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 10,257, Feb. 6, 1979, abandoned. This application May 16, 1980, Ser. No. 150,587
Claims priority, application Japan, Feb. 24, 1978, 53-19925
Int. Cl.³ C25D *15/00;* **C25B** *11/03, 11/04*
U.S. Cl. 204—16 **15 Claims**



1. An electrode which comprises a metal layer of silver bonded to a metallic electrode substrate, which metal layer contains partially exposed particles comprising silver, the content of the particles in the metal layer ranging from 5 to 80 wt.%.

4,290,860

PROCESS FOR MANUFACTURING ELECTRO-GALVANIZED STEEL SHEET EXCELLENT IN PAINT ADHERENCE

Kazuo Matsudo; Takeshi Adaniya; Masaru Ohmura; Masahiro Shoji, all of Fukuyama, and Tsutomu Watanabe, Yokosuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1980, Ser. No. 156,580
Claims priority, application Japan, Jul. 2, 1979, 54-82670
Int. Cl.³ C25D *7/06, 3/56*
U.S. Cl. 204—27 **2 Claims**

1. In a process for manufacturing a galvanized steel sheet, which comprises electro-galvanizing a steel sheet in an acidic galvanizing bath to form a galvanized layer excellent in paint adherence on the surface of said steel sheet;
the improvement characterized by comprising:
electro-galvanizing a steel sheet in an acidic zinc sulfate and iron sulfate galvanizing bath, with a pH value adjusted up to 1.5, containing iron of from 20 to 90 wt.% relative to the total amount of metals capable of being deposited in said galvanizing bath, with an electric current having a current density of from 10 to 40 A/dm^2, to form on the surface of said steel sheet a galvanized zinc-iron layer, containing iron of from 5 to 35 wt.% relative to the total amount of said galvanized

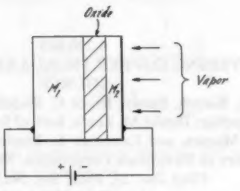
layer in an amount of from 1 to 50 g/m^2 per side of said steel sheet.

4,290,861

GROWTH OF OXIDE FILMS BY VAPOR SOLID STATE ANODIZATION

Martin R. Gaerttner, Dearborn, and Robert C. Jaklevic, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 16, 1979, Ser. No. 58,041
Int. Cl.^{3} C25D *11/04, 11/06, 11/26*
U.S. Cl. 204—56 R **7 Claims**



1. A method of solid state anodization using fluid infusion which comprises:

(A) providing:

1. a solid anode,
2. a solid permeable cathode, and
3. a solid insulator that separates and contacts the anode and permeable cathode;

(B) contacting the permeable cathode with an oxidant that infuses through the permeable cathode; and

(C) biasing the anode sufficiently positive to cause the anodization.

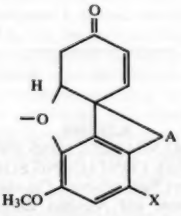
4,290,862

METHOD FOR THE PREPARATION OF NARWEDINE-TYPE ENONES

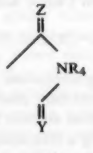
Radoslav Y. Vlahov; Dikran A. Krikoryan; Maria S. Zagorova; Maya H. Ninova, and Stoyan P. Parushev, all of Sofia, Bulgaria, assignors to Edinen Centar P Chimia, Sofia, Bulgaria

Filed Nov. 14, 1979, Ser. No. 94,352
Int. Cl.^{3} C25B *3/00;* **C07D** *221/18*
U.S. Cl. 204—59 R **2 Claims**

1. Method for the preparation of narwedine enones and derivates thereof of the formula



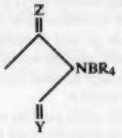
wherein A is selected from the group consisting of



(a)

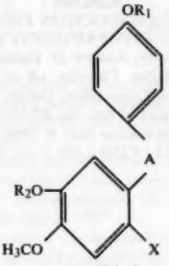
and

-continued



(b)

Z and Y being selected from the group consisting of H_2 and O, X being a halogen atom, R_4 a low order alkylic group selected from the group consisting of $CH_2C_6H_5$ and $CH_2C_6H_4OCH_3$ and B $HClO_4$ and related salts of organic and inorganic acids which comprises electrochemically oxidizing a diphenolic compound of the formula



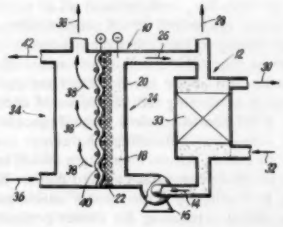
wherein A and X are as represented above and R_1, and R_2 are alkylic groups selected from the group consisting of $CH_2C_6H_5$ and $CH_2C_6H_4OCH_3$, said oxidizing being effected in a divided cell at an anode potential ranging from 1.1 to 1.7 volts in the presence of a solvent and a conductive salt.

4,290,863

PROCESS FOR ELECTROLYSIS OF BRINE BY MERCURY CATHODES

Eduardo D. Nogueira, Avda, Mediterraneo 47; Luis Alonso S. Infanzon, Avda, Valladolid 73, and Enrique H. Tezanos, Aniceto Marinas 110, all of Madrid, Spain

Continuation-in-part of Ser. No. 840,224, Oct. 7, 1977, Pat. No. 4,209,370. This application Dec. 18, 1979, Ser. No. 104,829
Claims priority, application Spain, Oct. 8, 1976, 452.238
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.^{3} C25B *1/38*
U.S. Cl. 204—99 **7 Claims**



1. A process for electrolysis of brine by a mercury cathode, said process comprising:

providing an electrolytic cell;

dividing said cell into an anolyte section for discharge of chlorine and a cathode section by disposing a membrane in said cell;

providing an anode in said anolyte section;

employing a film of mercury in said cathode section as the

cathode, and employing the brine in said anolyte section as an anolyte;

continuously flowing said film of mercury across one side of said membrane, and continuously flowing said brine across an opposite side of said membrane;

positioning said membrane against said anode of said anolyte section to avoid breakage of said membrane due to pressure of said film of mercury;

providing said membrane with porous means impervious to passage of the mercury therethrough for preventing short circuits between said anode and said mercury cathode of said cell, said porous means being pervious to passage therethrough of ions electrolyzed from the brine; and

using said film of mercury to continuously remove an amalgam from said cathode section, said amalgam being converted from said ions in said cathode section.

4,290,864

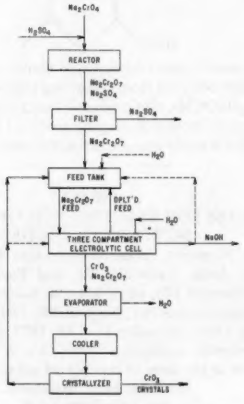
CHROMIC ACID PRODUCTION PROCESS USING A THREE-COMPARTMENT CELL

Nicholas Shuster, Perry; Andrew D. Babinsky, Chagrin Falls, and William E. Kidon, Chardon, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 43,382, May 29, 1979, abandoned. This application May 6, 1980, Ser. No. 147,210

Int. Cl.³ C25B *1/00, 1/16, 1/22*

U.S. Cl. 204—103 **34 Claims**



1. The method of producing concentrated chromic acid from alkali metal dichromate while coincidentally producing virtually chrome-free, concentrated alkali product, all at enhanced current efficiency, which process comprises:

(A) introducing to the center compartment of a three-compartment electrolytic cell, alkali metal dichromate at a concentration above about 900 grams per liter, said dichromate containing reduced forms of chromium, if such exist, at substantially below about 2 percent of the dichromate hexavalent chromium, the center compartment of said cell having porous diaphragm means separating same from an anode compartment, and further having substantially hydraulically impermeable cation-exchange membrane means separating the center compartment from a cathode compartment;

(B) permitting center compartment dichromate-containing electrolyte flow through said porous diaphragm to said anode compartment;

(C) introducing electrolyte to said cathode compartment;

(D) applying electrolyzing current to said electrolytic cell at a density above about 2 amperes per square inch;

(E) withdrawing from said cathode compartment electrolyzed catholyte solution having an alkali product concentration of above about 400 grams per liter and containing below about 2 p.p.m. chromium; and

(F) withdrawing from said anode compartment anolyte solution containing above about 700 grams per liter of chromic acid; whereby concentrated anolyte chromic acid can be produced at a current efficiency above about 90 percent while, simultaneously, concentrated catholyte alkali product can be prepared at a current efficiency above about 60 percent.

4,290,865

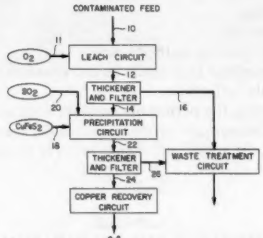
RECOVERING COPPER FROM A COPPER-BEARING SOURCE

Frank A. Baczek, Sandy; Bruce C. Wojcik, Kearns; Alexander A. Jueschke; Daniel M. Lewis, both of Salt Lake City; Jack C. Otto, Magma, and Lawrence L. Tuttle, Sandy, all of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 23, 1980, Ser. No. 114,477

Int. Cl.³ C25C *1/12*

U.S. Cl. 204—106 **12 Claims**



1. A process for recovering copper from a contaminated copper-bearing source, comprising:

a. leaching the copper-bearing source in an acidic leach solution to produce a liquor containing dissolved copper;

b. precipitating simple copper sulfides from said liquor by reacting said liquor with chalcopyrite and sulfur dioxide; and

c. recovering copper from said simple copper sulfides.

4,290,866

REMOVAL OF MANGANESE IONS FROM ZINC AND MANGANESE CONTAINING SOLUTIONS

Gerald L. Bolton, Fort Saskatchewan, Canada; Verner B. Sefton, Makati, Philippines, and Nicolaus Zubryckyj, Edmonton, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Oct. 22, 1979, Ser. No. 86,877

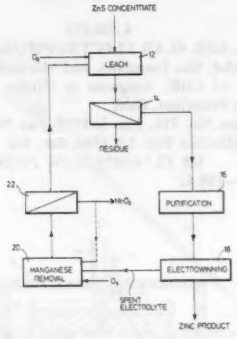
Claims priority, application United Kingdom, Dec. 20, 1978, 49207/78

Int. Cl.³ C25C *1/16*

U.S. Cl. 204—119 **5 Claims**

1. A process for removing manganese ions from an aqueous acidic sulphate solution containing zinc and manganese ions without removing a substantial amount of zinc ions from the solution, said solution having a free acidity of from about 0.1 molar to about 2 molar and containing from about 5 gpl to

about 170 gpl zinc ions and from about 1 to about 25 gpl manganese ions, comprising treating the solution with ozone to



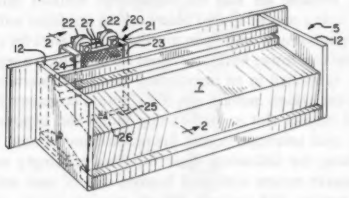
oxidize manganese ions to manganese dioxide, and removing manganese dioxide from the solution.

4,290,867

MEANS FOR AND METHOD OF PRODUCING SMOOTH ELECTRO-POLISHED SURFACES

John F. Jumer, 16 W. 131 Timber Trails Dr., Oak Brook, Ill. 60521

Filed Jun. 30, 1980, Ser. No. 163,982
Int. Cl.[3] C25F *3/16, 7/00;* C25D *21/00, 17/04*
U.S. Cl. 204—129.35 **11 Claims**



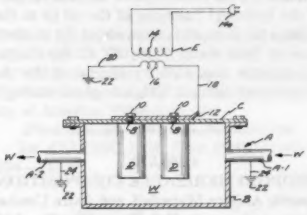
1. A method of electro-polishing an elongated flat or slightly curved surface on an object which comprises positioning the object with said surface being vertically oriented on the horizontal leg of an elongated L-shaped member formed of impervious material and having the horizontal leg covered by a strip of resilient rubber-like material at least in the area on which said object is supported when said elongated vertical surface is uniformly spaced a small distance from the upright leg of said L-shaped member, positioning said object on said L-shaped member so that said elongated vertical surface and the opposing surface of the upright leg of said L-shaped member define two elongated walls of a vertical elongated chamber for holding a polishing bath, closing the opposite ends of said chamber by providing end wall members thereat in liquid-tight relationship therewith, movably supporting cathode means on said upright leg with said cathode having a generally planar active portion depending into said chamber and said polishing bath therein in uniformly spaced relationship with said elongated vertical surface when moved to different positions in said chamber, conducting direct electrical current between said elongated vertical surface having a positive charge and said active portion of said cathode having a negative charge, and moving said cathode means between opposite ends of said chamber until said elongated vertical surface is electro-polished.

4,290,868

IRON PLUMBING CORROSION MINIMIZING METHOD

Michael H. Mack, 3101 S. Fairview Rd., No. 152, Santa Ana, Calif. 92704

Filed Apr. 7, 1980, Ser. No. 137,917
Int. Cl.[3] C23F *13/00*
U.S. Cl. 204—148 **2 Claims**



1. A method of protecting an iron plumbing system through which water containing soluble calcium salts flows intermittently from corrosion and the build up of scale therein which includes the steps of:

a. disposing at least one magnesium anode in a confined space that forms a part of said system and is located in the portion of said system adjacent the location where said water enters the same;

b. establishing electrical communication between said anode and system to provide a magnesium-iron galvanic cell in which the magnesium of the anode at the interface with said water tends to transform from the atomic to the ionic state with a driving force substantially greater than the iron of said plumbing system so long as said interface surface is not protected by a film of magnesium oxide or magnesium hydroxide, said magnesium as it goes into solution in said water removing free oxygen and carbon dioxide therefrom as said magnesium is in part transformed to soluble magnesium bicarbonate and will so remain until the portion of magnesium in the water in the form of magnesium hydroxide raises the pH of said water to above 8.7, and at least a portion of the magnesium hydroxide formed being in the gelatinous lyophilic colloid state that envelops insoluble particles in suspension in the water to prevent them from settling out; and

c. superimposing an alternating electric current on said magnesium iron galvanic cell to obtain optimum transformation of the magnesium in said anode from the atomic to the ionic state as said water flows by said anode.

4,290,869

PHOTOPOLYMERIZABLE ORGANOPOLYSILOXANE/SILANE COMPOSITIONS

Raymond Pigeon, Francheville, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jan. 23, 1980, Ser. No. 114,340
Claims priority, application France, Jan. 24, 1979, 79 01750
Int. Cl.[3] C08F *2/46*
U.S. Cl. 204—159.13 **43 Claims**

1. A liquid, storage stable organopolysiloxane having a viscosity of from 60 mPa.s to 20,000 mPa.s at 25° C., comprising the reaction product of (i) an α,ω-dihydroxydiorganopolysiloxane oil, the organo functions being selected from the group consisting of methyl, ethyl, n-propyl, vinyl, phenyl and trifluoropropyl, with at least 70% of such functions being methyl and no greater than 3% being vinyl, and said oil having a viscosity ranging from about 70 to 500 mPa.s at 25° C., (ii) a silane having the formula $Z(G)SiR_a(Q)_{3-a}$ wherein Z is $CH_2{=}C(R')—COO—$ or HS—, and further wherein the symbols R, which may be the same or different, are methyl, ethyl, n-propyl, vinyl or phenyl, R' is hydrogen or methyl, the sym-

bols Q, which may be the same or different, are methoxy, ethoxy, n-propoxy, β-methoxyethoxy or, when any two are taken together, the divalent radical —O—$C(CH_3)_2$—$C(CH_3)_2$—O—, G is a linear or branched chain alkylene radical having from 1 to 8 carbons, a is a number ranging from 0 to 2; and (iii) a catalyst selected from the group consisting of alkyl titanates and polytitanates and diorganotin salts of aliphatic carboxylic acids, said organopolysiloxane being prepared by reacting an intimate admixture of the α,ω-dihydroxydiorganopolysiloxane (i), the silane (ii) and the catalyst (iii) wherein the ratio of the hydroxyl functions of the oil (i) to the Q radicals of the silane (ii) comprises from about 0.1 to about 0.95 at a temperature of from about 5° to 180° C. for a contact time such that no greater than 45% by weight of the theoretical amount of byproduct alcohol, QH, is evolved during the reaction.

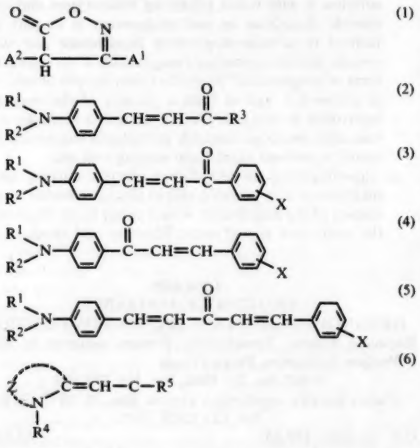
4,290,870

PHOTOPOLYMERIZABLE COMPOSITIONS

Syunichi Kondoh; Akihiro Matsufuji, and Akira Umehara, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 18, 1979, Ser. No. 40,370
Claims priority, application Japan, May 22, 1978, 53-60718
Int. Cl.³ C08F *2/50*; G03C *1/68, 1/70*
U.S. Cl. 204—159.15 **31 Claims**

1. In a photopolymerizable composition comprising (1) an addition-polymerizable compound having at least one ethylenically unsaturated double bond and (2) a photopolymerization initiator as essential components, the improvement which comprises said photopolymerization initiator comprising a combination of (a) a 5-isoxazolone represented by the general formula (1) and (b) an aromatic carbonyl compound, a dialkylamino aromatic carbonyl compound represented by any of formulae (2) to (5), a compound represented by the formula (6) or 2-(α-thioxophenetylidene)-3-methylnaphtho[1,2-d][1,3]thiazoline:



(1)

(2)

(3)

(4)

(5)

(6)

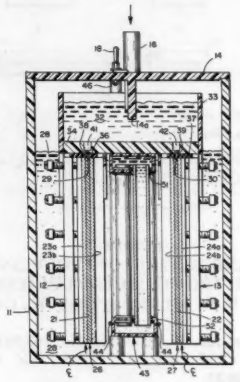
wherein in the formula (1) A^1 and A^2 each represent an alkyl group, an alkylcarbonyl group, an alkoxycarbonyl group, an aryl group, an arylcarbonyl group or a hydrogen atom and may be the same or different; in formulae (2) to (5) R^1 and R^2 each represent an alkyl group and may be the same or different, R^3 represents an alkyl group, an aryl group, an aralkyl group, an alkoxy group, an aryloxy group or a 5- or 6-membered heteroaromatic ring, and X represents a substituent having a Hammett's σ value in the range of about −0.9 to +0.7; and in the formula (6) R^4 represents an alkyl group or an alkenyl group, R^5 represents an alkyl group, an aryl group, a thienyl group or a furyl group, and Z represents an atomic group necessary to form a nitrogen containing heterocyclic ring.

4,290,871

VERTICAL GEL SLAB ELECTROPHORESIS METHOD

Peter S. Hoefer, San Francisco, and Michael Whitesides, Dale City, both of Calif., assignors to Hoefer Scientific Instruments, San Francisco, Calif.

Division of Ser. No. 714, Jan. 3, 1979, Pat. No. 4,224,134. This application Feb. 13, 1980, Ser. No. 121,288
Int. Cl.³ G01N *27/26, 27/28*
U.S. Cl. 204—180 G **5 Claims**



1. A vertical gel slab electrophoresis method using as a sample unit a pair of spaced plates which are filled with gel in a casting mode and with open top and bottom slots for contacting upper and lower buffer solutions across which a separating voltage is applied in an operational mode and including support means which include a buffer solution container for sealing said bottom slot in said casting mode and exposing both slots to said solutions in said operational mode, said method comprising the following steps: inserting an empty unit into said support means with said bottom slot of said unit being sealed against said support means; placing gel in said unit through its open top slot; thereafter removing such unit from said support means and reinserting said unit in said support means so that both top and bottom slots are exposed but that one of said slots is isolated from said lower buffer solution by contact with said support means; placing said top and bottom slots of said unit in liquid contact with said upper and lower buffer solutions including the step of filling said support means with upper buffer solution.

4,290,872

HIGH TEMPERATURE REFERENCE ELECTRODE

James V. Monter, Alliance; James P. Sorenson, Louisville, and George J. Theus, Canton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

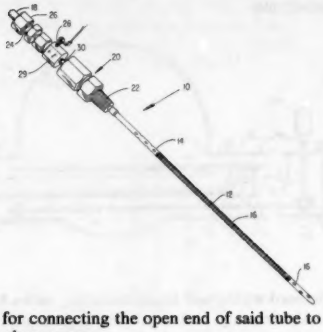
Continuation-in-part of Ser. No. 857,850, Dec. 5, 1977, abandoned. This application Jun. 28, 1979, Ser. No. 52,888
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—195 F **4 Claims**

1. A reference electrode for detecting dissolved oxygen in a high temperature reducing atmosphere above 400° F. comprising:

a tube having a closed end and an open end and made of a palladium alloy material predominantly palladium and being permeable to hydrogen;

a sleeve of material having a series of openings along the

length thereof and being affixed around said alloy tube to define a space between said alloy tube and said sleeve; and



means for connecting the open end of said tube to a supply of hydrogen gas.

4,290,873

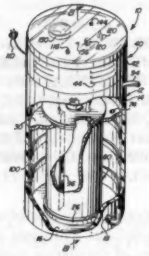
CHLORINE GAS GENERATOR APPARATUS

Ron L. Weaver, 11615 N. 33rd Ave., Phoenix, Ariz. 85029

Continuation-in-part of Ser. No. 51,444, Jun. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 5,211, Jan. 22, 1979, abandoned. This application May 15, 1980, Ser. No. 150,170

Int. Cl.[3] **C25B** *15/08, 9/00, 11/03, 13/04*

U.S. Cl. 204—228 **24 Claims**



1. Apparatus for electrolytically generating a gas from a salt solution, comprising, in combination:

first cylinder means adapted to contain a quantity of water, including,

a housing portion,

a cylinder disposed beneath the housing portion,

a bottom end wall closing the cylinder,

a plate disposed in the cylinder and spaced apart from the housing portion, and

a hole in the plate;

cathode electrode means disposed in the first cylinder means;

second cylinder means substantially coaxially aligned with the hole in the plate and disposed in the first cylinder means and in the quantity of water therein and adapted to contain a quantity of salt solution in which the salt is dissociated into ions and comprising a cell porous to the migration of ions from the salt solution but substantially impervious to chemical attack;

cathode electrode means disposed in the first cylinder means and in the quantity of water therein;

anode electrode means disposed in the second cylinder means and in the quantity of salt solution therein;

direct current means electrically connected to the anode electrode means and to the cathode electrode means for providing a current flow between the anode means and the cathode means for generating a gas from the dissociated salt ions; and

conduit means extending from the second cylinder means through which the generated gas flows out of the second cylinder means.

4,290,874

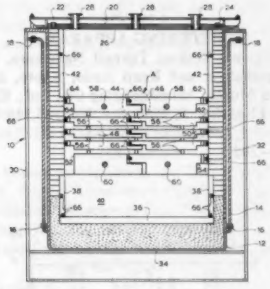
GASKET FOR SEALING JOINTS IN CARBONACEOUS ELEMENTS IN ELECTROLYSIS CELL

Matthew J. McMonigle, New Kensington, and Chester H. Klingensmith, Leechburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 25, 1980, Ser. No. 162,754

Int. Cl.[3] **C25C** *3/08, 7/04;* **C25B** *11/12*

U.S. Cl. 204—243 R **4 Claims**



1. A cell for producing metal by electrolytic reduction of a metal halide dissolved in at least one molten halide of higher electrodecomposition potential than the metal halide, said cell having:

(a) a plurality of cell elements, including an inner refractory lining and a plurality of carbonaceous elements, said carbonaceous elements including:

(i) a plurality of carbonaceous lining elements located inside of, adjacent to and abutting a portion of the inner refractory lining, and

(ii) a plurality of carbonaceous electrode elements abutting and located adjacent to the inner refractory lining; and

(b) carbon felt gaskets located between at least some of the abutting elements for sealing of the joints of abutment in order to minimize the harmful effects of dislocation of such carbonaceous elements.

4,290,875

SPUTTERING APPARATUS

Roger G. Duckworth, Weybridge, England, assignor to Ultra Electronic Controls Limited, London, England

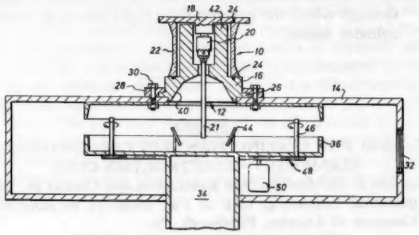
Filed Mar. 18, 1980, Ser. No. 131,506

Int. Cl.[3] **C23C** *15/00*

U.S. Cl. 204—298 **7 Claims**

1. A sputtering apparatus, comprising a cathode mount adapted to support a target rod and to be electrically connected to a source of high voltage, an anode supporting the cathode mount and electrically insulated therefrom, means for supporting an object to be sputter-coated arranged outside the volume bound by the anode and the target rod, wherein the anode has a surface greater in area than the target rod so as to enable the flow of a current of sufficient density to raise the

temperature of the target rod to substantially 1000° C., said anode surface being rotationally symmetrical and centered on



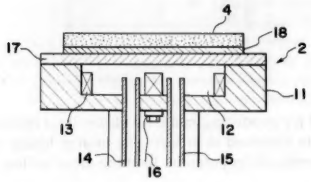
the target rod and so shaped as to direct the bombarding ions at an angle onto the surface of the target rod.

4,290,876

SPUTTERING APPARATUS

Hiroshi Nishiyama, Mukou; Takeshi Nakamura, Uji; Suehiro Kato, Nagaokakyo, and Kenji Ando, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 5, 1980, Ser. No. 156,516
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—298 **5 Claims**



1. A sputtering apparatus for the deposition of non-metallic thin-films on substrates, comprising:

a pair of opposed electrodes;

a substrate layer mounted on one of said electrodes;

a target layer of a non-metallic material mounted on the other of said pair of electrodes, said target layer comprising Zn0;

a low temperature melting alloy layer interposed between said target layer and the other of said pair of electrodes for soldering said target layer to said other of said pair of electrodes, said low temperature melting alloy layer including Pb, Sn, and Zn, and further including at least one additive selected from the group consisting of Sb, Al, Ti, Si, Cd and Cu.

4,290,877

SPUTTERING APPARATUS FOR COATING ELONGATED TUBES AND STRIPS

Robert Blickensderfer, Albany, Oreg., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

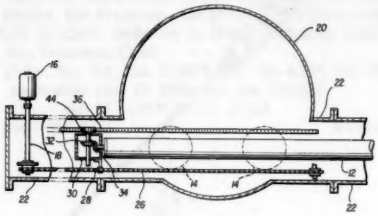
Filed Sep. 8, 1980, Ser. No. 184,852
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—298 **5 Claims**

1. Apparatus for sputter-coating a layer of uniform thickness onto the surface of an elongated workpiece, comprising:

a sputtering chamber with at least one disk-shaped cathode located therein;

means attached to said sputtering chamber for accommodating the entire length of said elongated workpiece; said means for accommodating said workpiece being greater in length than said vacuum chamber and locating a portion of said workpiece adjacent said at least one disk-shaped cathode;

means for forming a sputtering plasma in said sputtering chamber; and



means located within said accommodating means for simultaneously rotating said workpiece while moving said workpiece along the length of said accommodating means and past said at least one disk-shaped cathode during a sputtering operation to deposit a coating of uniform thickness on said elongated workpiece.

4,290,878

NO_x CONTROL IN PLATINUM-PROMOTED COMPLETE COMBUSTION CRACKING CATALYST REGENERATION

William A. Blanton, Jr., Woodacre, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 965,978, Dec. 8, 1978, abandoned. This application May 5, 1980, Ser. No. 146,831
Int. Cl.[3] C10G *11/18, 11/22*
U.S. Cl. 208—120 **5 Claims**

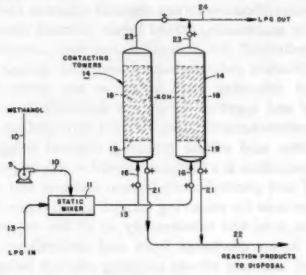
1. In a process for cracking hydrocarbons in the absence of externally supplied molecular hydrogen in a cracking system employing an inventory of circulating particulate solids including cracking catalyst particles, said inventory being cycled between a cracking zone and a catalyst regeneration zone, wherein said hydrocarbons are cracked in contact with said catalyst particles and coke is formed on said catalyst particles at cracking conditions in said cracking zone, flue gas is formed by burning coke off said catalyst particles with a molecular oxygen-containing and molecular nitrogen-containing gas at regeneration conditions in said regeneration zone, and carbon dioxide and nitrogen oxides are formed by combusting carbon monoxide in the presence of carbon monoxide combustion promoter particles comprising a combustion-promoting metal or compound of a metal associated with at least one particulate solid, said particulate solid being selected from at least one of (1) at least a portion of said catalyst particles, (2) a particulate solid physically admixed with said catalyst particles in said inventory of particulate solids, and (3) a particulate solid retained in said regeneration zone, the method for reducing the amount of nitrogen oxides in said flue gas comprising:

employing carbon monoxide combustion promoter particles including from 0.1 to 10,000 parts per million, by weight, of platinum and, for each part of platinum, from 0.001 to 1 part, by weight, of a nitrogen oxides-reducing component comprising at least one metal selected from rhodium and iridium.

4,290,879
REMOVAL OF CARBONYL SULFIDE FROM LIQUID HYDROCARBON STREAMS

Robert M. Woodall; Eugene Damron, both of New Orleans, La., and Martin B. Mick, Pensacola, Fla., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 10, 1976, Ser. No. 713,171
Int. Cl.[3] C10G *19/073*
U.S. Cl. 208—232 5 Claims



1. In a process for removing carbonyl sulfide from an essentially water-free liquid hydrocarbon stream the improvement comprising:

mixing said hydrocarbon stream containing carbonyl sulfide with liquid methanol;

passing said mixed methanol-hydrocarbon stream upwardly through a bed of solid potassium hydroxide arranged in a reaction vessel, said potassium hydroxide, methanol and carbonyl sulfide reacting to form reaction products H_2O and $KSCOOCH_3$;

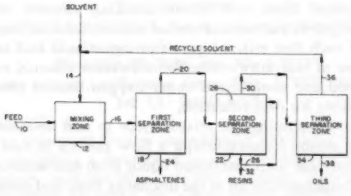
the superficial velocity of said hydrocarbon stream being less than about one foot per minute; and

separating said reaction products from said treated hydrocarbon stream by downward flow of said reaction products and upward flow of said treated hydrocarbon stream in said vessel to provide essentially 100% removal of said carbonyl sulfide from said liquid hydrocarbon stream.

4,290,880
SUPERCRITICAL PROCESS FOR PRODUCING DEASPHALTED DEMETALLIZED AND DERESINED OILS

Robert E. Leonard, Oklahoma City, Okla., assignor to Kerr-McGee Refining Corporation, Oklahoma City, Okla.

Filed Jun. 30, 1980, Ser. No. 164,599
Int. Cl.[3] C10G *21/00*
U.S. Cl. 208—309 14 Claims



1. A process for producing a low metals content deasphalted oil from a heavy hydrocarbon material comprising:

introducing a heavy hydrocarbon material comprising oils, resins, asphaltenes and associated organometallic compounds and a solvent into a first separation zone maintained at a temperature at least equal to the critical temperature of said solvent and a pressure at least equal to the critical pressure of said solvent to effect a separation of said heavy hydrocarbon material and solvent into a first light phase comprising oils, resins, some of the organometallic compounds and solvent and a first heavy phase comprising asphaltenes, organometallic compounds and some solvent;

introducing said first light phase into a second separation zone maintained at a temperature level higher than the temperature in said first separation zone and at an elevated pressure to effect a separation of said first light phase into a second light phase comprising oils, entrained resins and organometallic compounds and solvent which collects in an upper portion of said second separation zone and a second heavy phase comprising resins and some solvent;

withdrawing at least a portion of said second heavy phase from said second separation zone;

recycling at least a portion of said withdrawn second heavy phase into said upper portion of said second separation zone to contact said second light phase and settle through said second light phase to remove at least a portion of the entrained resins and organometallic compounds; and

recovering said second light phase comprising solvent and deasphalted oil having a reduced metals content after contact with said recycled second heavy phase.

4,290,881
PROCESS FOR THE SEPARATION OF UNSATURATED COMPOUNDS FROM LIQUID HYDROCARBON MIXTURES

Maximillian Dielacher, Hamburg, and Uwe Hansen, Jesteburg, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 799,634, May 23, 1977, abandoned.
This application May 10, 1979, Ser. No. 37,805
Int. Cl.[3] C10G *25/02*
U.S. Cl. 208—310 R 13 Claims

1. A process for the separation of unsaturated hydrocarbon compounds from a liquid, paraffin-rich hydrocarbon mixture comprising:

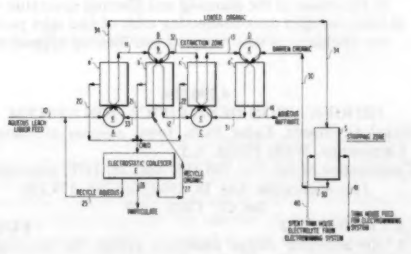
(a) contacting the hydrocarbon mixture with a dehydrated, macroporous cation exchange resin in the form of a metal salt whereby the unsaturated compounds are adsorbed by the resin,

(b) contacting said dehydrated macroporous cation exchange resin containing adsorbed unsaturated compounds with a mononuclear aromatic hydrocarbon at a temperature of 50° to 150° C. whereby the adsorbed unsaturated compounds are desorbed.

4,290,882
ELECTROSTATIC SEPARATION OF IMPURITIES PHASE FROM LIQUID-LIQUID EXTRACTION

John P. Dempsey, Lakeland, Fla., assignor to Davy Powergas Inc., Lakeland, Fla.

Filed Dec. 21, 1978, Ser. No. 971,748
Int. Cl.[3] B01D *11/04*
U.S. Cl. 210—634 5 Claims



1. In a liquid-liquid extraction process wherein metal values

are recovered from an aqueous metal-containing leach liquor by treating said liquor with an organic extracting medium comprising an organic solvent containing an organic extracting agent and wherein during the separation of the organic extracting medium phase from the aqueous solution phase in a separation vessel used in such a process, a third phase dispersion layer of impurities is formed containing a major amount of organic solvent and minor amounts of aqueous solution and undissolved particulate matter, the improvement which comprises:

(a) removing said third phase layer from the organic extract and aqueous phases in said separation vessel;

(b) feeding said removed third phase layer to a coalescing zone through which an electrostatic field is applied so as to cause the aqueous solution and particulate matter entrained in the organic solvent of the third phase layer to coalesce and separate and thereby directly form in said coalescing zone an organic phase depleted in aqueous and particulate matter suitable for return to the organic extracting medium of the extraction process, an aqueous phase depleted in organic and particulate matter suitable for return to the leach liquor of the extraction process, and a separate aqueous material containing undissolved particulate matter;

(c) separating the formed organic phase, aqueous phase and aqueous material containing undissolved particulate matter;

(d) returning said separated organic phase to the extraction process; and

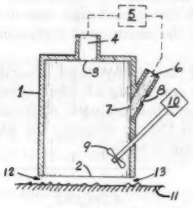
(e) returning said separated aqueous phase to the extraction process.

4,290,883

CLASSIFYING DEVICE FOR AGGREGATES IMMERSED IN A FLUID

Nicholas Sama, 19120 Bel Aire Dr., Miami, Fla. 33157

Filed Jul. 5, 1977, Ser. No. 812,487
Int. Cl.[3] E04H *3/20*
U.S. Cl. 210—169 **8 Claims**



1. In combination with an external pumping and filtering apparatus, an aquarium gravel sweep comprising:

a chamber having at least one inlet port, at least one outlet port, and an open mouth in movable close proximity to the aquarium gravel being swept;

at least one outlet duct connecting each of said outlet ports to the intake of the pumping and filtering apparatus; and,

at least one inlet duct connecting each of said inlet ports to the discharge of said pumping and filtering apparatus.

4,290,884

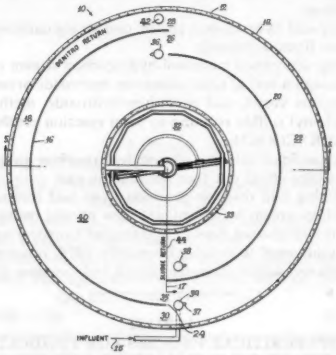
NITRIFICATION-DENITRIFICATION SYSTEM

Mikkel G. Mandt, Cedar Falls, Iowa, assignor to Clevepak Corporation, White Plains, N.Y.

Continuation of Ser. No. 936,910, Aug. 25, 1978, abandoned. This application Aug. 18, 1980, Ser. No. 179,239
Int. Cl.[3] C02F *3/30*
U.S. Cl. 210—195.3 **3 Claims**

1. An activated sludge treatment system for removal of pretreatment BOD and nitrogen values from waste water, comprising a mixed liquor tank and a clarifier centrally located at the interior of said mixed liquor tank for receiving mixed liquor from said mixed liquor tank for providing a clarified effluent and a return sludge component for return to said mixed liquor tank,

said mixed liquor tank comprising partition means for defining in said tank an aeration zone for maintaining mixed liquor biomass therein under endogenous oxygenation respiration conditions, a nitrate cracking channel adjacent said aeration zone for maintaining mixed liquor biomass therein under endogenous nitrate respiration conditions, and a dentrification return channel adjacent said aeration zone for maintaining mixed liquor biomass therein under oxygen-limited denitrification reaction conditions, said denitrification return channel and said nitrate cracking channel adjoining each other at the respective ends thereof and together forming a substantially continuous nitrification-denitrification channel surrounding said aeration zone, said nitrate cracking channel being in fluid communication at a first end thereof with a respective first end of said denitrification return channel and with said aeration zone for receiving aerated mixed liquor from said aeration zone and substantially all of the oxygen-limited mixed liquor discharge from said denitrification return channel, and said nitrate cracking channel being in fluid communication at a second end thereof with said aeration zone and a respective second end of said denitrification



return channel for mixed liquor discharge thereto such that a first portion of the discharge from said nitrate cracking channel is received by said aeration zone and a second portion of said discharge is received by said second end of said denitrification return channel, said denitrification channel being adapted to maintain under anoxic conditions said second portion of the mixed liquor discharge received from said nitrate cracking channel and discharged to said second end of said nitrate cracking channel such that mixed liquor flowing around said aeration zone in said nitrification-denitrification channel is maintained and conditioned under oxygen limited conditions suitable for denitrification,

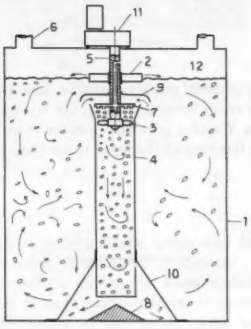
means for aerating the mixed liquor in said aeration zone, and means for establishing a flow pattern in said mixed liquor tank such that mixed liquor from said aeration zone and substantially all of the discharge from said denitrification return channel flow into said nitrate cracking channel, and mixed liquor from said nitrate cracking channel flows into both said aeration zone and said denitrification return channel,

means for introducing waste water influent to be treated into the nitrate cracking channel,

means for conducting mixed liquor from said aeration zone to said clarifier, and

means for conducting return sludge from said clarifier to said first end of said nitrate cracking channel.

4,290,885
AERATION DEVICE
Dochan Kwak, 1935 Farragut Way, San Jose, Calif. 95133
Continuation of Ser. No. 863,068, Dec. 22, 1977, abandoned.
This application Mar. 2, 1979, Ser. No. 16,890
Int. Cl.³ C02F *3/16*; B28B *1/26*
U.S. Cl. 210—197 **4 Claims**



1. An apparatus for aerating liquid, especially wastewater located in a basin, comprising a basin containing the liquid defining a free surface above which a gas space filled with oxygen mixture is provided, a vertically disposed shaft, means operatively connected for rotating said shaft about a substantially vertical axis, a rotatable surface aeration device mounted on said shaft and immersible into said liquid for circulating and aerating said liquid near the surface, a flow guide tube vertically disposed and extending upwardly from a point just above the basin floor to a level just below said surface aerator, said guide tube surrounding said shaft and defining an inlet region at its top end thereof, at least one down pumping impeller disposed in said guide tube and mounted on said shaft for creating a downward flow in said guide tube, at least one gas conduit for communicating said gas space above the liquid surface with the inlet region of said guide tube, restriction means for guiding flow of liquid into the inlet region, said restriction means located between the surface aerator and the top end of said guide tube, wherein said downward flow creates a low pressure in said inlet region of said guide tube so that the oxygen mixture is entrained therein by self-aspiration through said gas conduit, and the mixture of entrained gas and liquid thusly formed and traveling downwardly in said guide tube is discharged at its lower end into said basin.

4,290,886
FLOTATOR
Takeshi Takakuwa, Sapporo, Japan, assignor to Nagata Seisakusho Co., Ltd., Japan
Filed Feb. 29, 1980, Ser. No. 126,157
Claims priority, application Japan, Mar. 3, 1979, 54-24046
Int. Cl.³ B03D *1/00*
U.S. Cl. 210—219 **9 Claims**

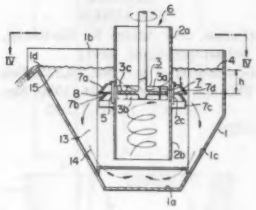
1. An improved flotator assembly for generating bubbles in a cell containing a quantity of liquid, and comprising:

separate, substantially coaxially disposed hollow sleeve members including an upper sleeve member partially immersed in a liquid contained within said cell, and further including a lower sleeve member totally surrounded by said liquid, said upper and lower sleeves including open, interior portions spaced from one another a predetermined distance, thereby defining a spaced region between said sleeves which is located more closely to the surface of said liquid than to a bottom surface of said cell;

rotatable upper blade means located within said spaced region and having an area of rotation confronting the open, interior portion of said upper sleeve for generating a substantially bubble-rich flow of liquid within the immediate area of rotation of said upper blade means;

rotatable lower blade means located within said spaced region and having an area of rotation confronting the open, interior portion of said lower sleeve for recycling a high velocity flow of liquid between the interior portion of said lower sleeve and a remaining portion of said liquid-filled cell, wherein said high velocity flow is substantially devoid of bubbles;

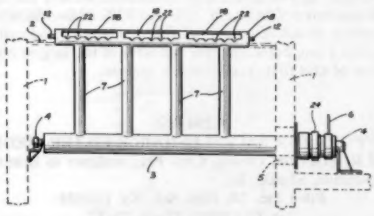
partition means located between said upper and lower blade means and substantially spanning said spaced region for



preventing said bubble-rich flow of liquid from mixing with said high velocity flow within said spaced region; and

frusto-conical stabilizer means surrounding said spaced region for directing said high velocity flow toward the bottom surface of said cell, thereby generating a jet stream effect which effectively draws the bubble-rich liquid flow from the area of rotation of said upper blade means and into contact with said high velocity flow during passage through the remaining portion of said liquid-filled cell, significantly increasing the chance of contact between said bubbles and any solid particles contained within said high velocity flow.

4,290,887
LIQUID SURFACE DECANTER
Arthur D. Brown, and Stephen G. B. Jones, both of 65 Ocean Ave., Double Bay, New South Wales 2028, Australia
Filed Oct. 2, 1979, Ser. No. 81,294
Claims priority, application Australia, Oct. 3, 1978, PD6205
Int. Cl.³ E02B *15/04*
U.S. Cl. 210—242.1 **9 Claims**



1. A liquid surface decanter comprising a rotatable support pipe adapted to be placed below the surface of the liquid to be decanted in a substantially horizontal disposition, one or more downcomer pipes rigidly attached to, radially extending from and communicating with the interior of said support pipe, a header conduit rigidly attached to and communicating with said downcomer pipes at the opposite end thereof from said support pipe, said header conduit being orientated substantially

parallel with said support pipe, a buoyancy float arranged to support said header conduit on said liquid surface, and one or more weir slots longitudinally oriented in said header conduit and laterally displaced therein so that when said header conduit is supported on the surface of said liquid by said buoyancy float said liquid flows through said slots into said header conduit and hence down said downcomer pipes to said support pipe to be discharged therefrom, said weir slots incorporating opposed leading and trailing edges arranged so that liquid flows firstly over said trailing and then over said leading edge as said header conduit is lowered relative to said support pipe by rotation thereabout, and wherein said leading and trailing edges subtend a predetermined angle at the axis of said header conduit.

4,290,888

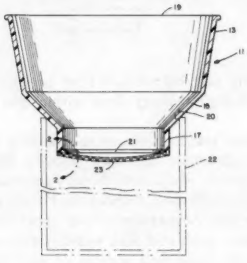
STRAINER

Hans H. Gartmann, and Achim K. Gartmann, both of 3900 Hicks Rd., Sebastopol, Calif. 95472

Continuation-in-part of Ser. No. 16,328, Feb. 27, 1979, abandoned. This application Feb. 26, 1980, Ser. No. 124,782

Int. Cl.³ B01D *33/00*

U.S. Cl. 210—356 **8 Claims**



1. A unitary strainer adapted to be disposed within the opening of an open top container which container is adapted to receive strained material, said strainer comprising a funnel shaped body having a relatively large opening at one end and a relatively small opening at its other end, a screen having a mesh of between 145 and 230 integrally bonded to said body and extending entirely across the relatively small opening of said body, the overall dimensions of said screen extending across the relatively small opening of the said body being slightly larger than the dimension of said opening itself whereby the screen is free to flex, said funnel shaped body including a first frusto-conical section at its one end, a cylindrical section at its other end and a second frusto-conical section intermediate its two ends, said cylindrical section having an outside diameter of between 70% and 90% of the diameter of the opening of said container, outside diameter of said cylindrical section being between 40% and 60% of the largest outside diameter of said first frusto-conical section.

4,290,889

SUPPORT FOR BACKFLUSHABLE FILTER MEDIA

Arnold R. Erickson, Orange City, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 24, 1980, Ser. No. 115,031

Int. Cl.³ B01D *27/06, 29/32*

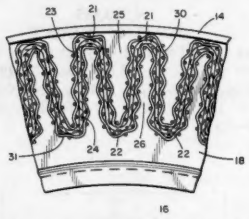
U.S. Cl. 210—484 **21 Claims**

1. A fluid filter comprising:

(a) a pair of spaced end caps;

(b) a pleated filter material extending between the end caps and secured thereto, the media having inner and outer pleated surface, the outer pleats having outwardly projecting crowns, the media having a pore size of X and a density of Y; and,

(c) anti-bellowing means mounted between the outer media pleats for preventing the diaphragmic movement of the filter pleats when fluid is forced through the media in cyclic fashion, the anti-bellowing means comprising a



plurality of metal staples in a three-dimensional, randomly oriented array forming a layer, the layer having a density less than Y and a pore size greater than X whereby the primary function of the layer is not that of a filter media.

4,290,890

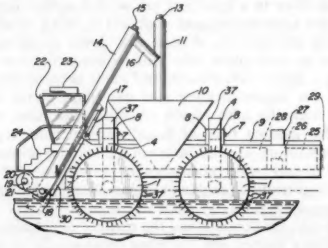
SLUDGE DEWATERING PROCESS AND VEHICLE FOR USE IN SUCH PROCESS

William J. Bauer, 422 S. Park Rd., LaGrange, Ill. 60525

Filed Feb. 12, 1979, Ser. No. 11,122

Int. Cl.³ C02C *3/00;* **B01D** *1/00*

U.S. Cl. 210—608 **10 Claims**



1. A process of obtaining dried or dewatered sludge from a sludge lagoon including:

reducing the moisture content of the sludge near the surface of the lagoon by exposing such sludge to the atmosphere for drying;

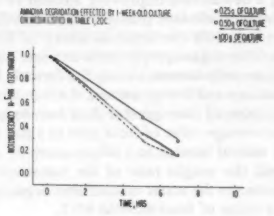
periodically agitating at least the surface portion of said sludge, including breaking and submerging the surface crust which forms during such drying, thereby exposing further wet sludge to the atmosphere, wherein said agitation is performed by operating upon the lagoon a buoyant vehicle which is supported on said lagoon by its buoyancy, propelling the vehicle across the surface of the lagoon and thereby agitating the sludge by breaking up the relatively dry sludge crust near the surface of the lagoon, until a thickened crust layer of relatively dry sludge of substantial thickness is formed at the surface of the lagoon over a body of wet sludge; and

removing the upper portion of said thickened crust layer of said relatively dry sludge from said lagoon while leaving such body of wet sludge in said lagoon.

4,290,891
METHOD FOR GROWING A DEAMMONIFYING CULTURE AND USE THEREOF IN WASTEWATER TREATMENT

Roy A. Ackerman, P.O. Box 5072, Charlottesville, Va. 22903

Division of Ser. No. 891,975, Mar. 30, 1978, Pat. No. 4,218,540. This application Mar. 7, 1980, Ser. No. 128,207
Int. Cl.³ C02F *3/34*
U.S. Cl. 210—611 6 Claims



1. A method for treating waste water and for degrading ammonia in said waste water which comprises:
   a. obtaining a culture having the identification of ATCC 31381 or one of its primary cultures, or mixtures thereof;
   b. adding said culture to said waste water in an amount sufficient to degrade a predetermined quantity of said ammonia;
   c. said culture and waste water being under aerobic conditions.

4,290,892
ANION EXCHANGE CHROMATOGRAPHIC SEPARATION OF POLYFUNCTIONAL COMPOUNDS

Seth R. Abbott, Concord, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 953,380, Oct. 23, 1978. This application Mar. 2, 1979, Ser. No. 16,847
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—656 14 Claims

1. A method of separating the components of a biological sample, said method comprising the steps of:
   (a) placing the biological sample in a column packed with a weak anion exchange composition comprising an inert porous particle having a size of about 5 to about 20 microns, and a modified tetra-substituted silane material of the general formula

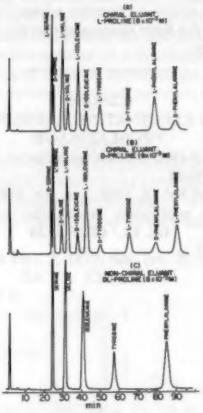
$$R_3—Si—(CH_2)_x—NYZ$$

wherein R is an alkyl or alkoxy, having 1 to 5 carbon atoms, x is an integer of 2 or 3, and Y and Z are hydrogen, alkyl, substituted alkyl, or an alkyl amine; said modified tetra-substituted silane material having been fixedly attached by covalent chemical bonding to the surface of said particle; with said modified tetra-substituted silane material fixedly attached by covalent bonding having been washed with an acid to produce said weak anion exchange composition, and;
   (b) separating said biological sample into its components using a solvent system comprising an aqueous buffer.

4,290,893
SEPARATION OF AMINO ACIDS BY LIQUID CHROMATOGRAPHY USING CHIRAL ELUANTS

P. Edgar Hare, Adelphi, Md., and E. Gil-Av, Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 37,061, May 8, 1979. This application Jun. 14, 1979, Ser. No. 48,422
Int. Cl.³ B01B *15/08*
U.S. Cl. 210—656 11 Claims

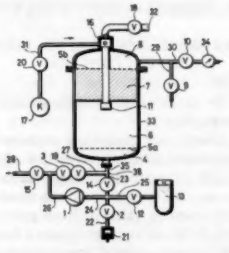


1. A process for separating enantiomers which comprises contacting the same on a solid non-chiral chromatographic support, with an aqueous solution containing less than about 10 volume % organic solvent, and containing a chiral ligand and a suitable metal ion capable of forming with the enantiomers inner sphere complexes of different stability and/or different partition coefficient.

4,290,894
PROCESS AND APPARATUS FOR CLEANING CONTAMINATED WATER

Gabor Török; Lajos Sárosi; Ferenc Grof; Tamas Becsei, and Peter Barta, all of Budapest, Hungary, assignors to Egyesült Müszaki Tömitö és Gépszakmai Ipari Szövetkezet, Budapest, Hungary

Continuation of Ser. No. 926,122, Jul. 19, 1978, abandoned. This application Apr. 25, 1980, Ser. No. 143,771
Int. Cl.³ D01A *15/02*
U.S. Cl. 210—661 8 Claims



1. A process for cleaning contaminated raw water, comprising: introducing raw water and a flocculator into the reaction space of a pressure vessel, which vessel has said reaction space at the bottom thereof, a filter space above the reaction space

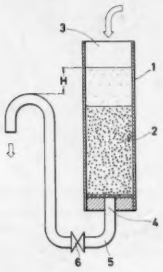
and containing a filter made of particles of elastic, granular material, and a clean water space above the filter space so that the raw water passes through said three spaces, whereby pollution material contained in the raw water becomes enclosed by the cells of the floccules of the flocculator and the floccules become absorbed by the filter particles; removing accumulated pollution material from the filter particles by regenerating the filter with a fluid flowing from the clean water space through the filter space into the reaction space; checking the purity of the water leaving the clean water space; and adjusting the purity by varying the velocity of the raw water introduced into the reaction space, to thereby adjust compactness of the filter material in the filter space and thereby the percentage of voids in the filter.

4,290,895

METHOD FOR ELIMINATING AMMONIA NITROGEN FROM SEWAGE

Tsuneo Iwamoto, 9-19, Karikuchidai 5-chome, Tarumi-ku, Kobe-City, Hyogo, Japan

Filed Feb. 6, 1980, Ser. No. 118,947
Claims priority, application Japan, Mar. 6, 1979, 54/26327
Int. Cl.[3] C02F *1/28*
U.S. Cl. 210—669 6 Claims



1. A method for eliminating ammonia nitrogen from sewage comprising the steps of:

adding alkali to sewage to convert ammonium ions to dissolved ammonia; and,

contacting the alkali-treated sewage with alkali-conditioned silica gel to adsorb said dissolved ammonia onto said alkali-conditioned silica gel.

4,290,896

DEWATERING FINE COAL SLURRIES USING ORGANOPOLYSILOXANES

David J. Gordon, Essexville, and James K. Wessel, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 27, 1980, Ser. No. 153,809
Int. Cl.[3] C02F *1/56*
U.S. Cl. 210—710 13 Claims

1. A process for dewatering an aqueous slurry of fine coal, said process comprising

(I) mixing a dewatering-improving amount of a water-dispersible organopolysiloxane with the aqueous slurry of fine coal, said organopolysiloxane having the formula $R_aH_bSiO_{(4-a-b)/2}$ wherein a and b are numbers, the sum of which has an average value of from greater than zero to less than four, b has an average value of from zero to a and R denotes an organic radical bonded to a silicon atom by a silicon-carbon bond,

(II) separating the organopolysiloxane-containing aqueous slurry of fine coal into an aqueous portion and a fine coal portion, said fine coal portion having a water content of less than 20 percent by weight,

4,290,897

DEWATERING FINE COAL SLURRIES USING TWO TYPES OF ORGANOPOLYSILOXANES

Terence J. Swihart, Essexville, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 27, 1980, Ser. No. 153,810
Int. Cl.[3] C02F *1/56*
U.S. Cl. 210—710 10 Claims

1. A process for dewatering an aqueous slurry of fine coal, said process comprising

(I) mixing a dewatering-improving amount of a water-soluble organopolysiloxane plus a water-emulsifiable organopolysiloxane with the aqueous slurry of fine coal, said water-soluble organopolysiloxane and said water-emulsifiable organopolysiloxane having the formula $R_aH_bSiO_{(4-a-b)/2}$ wherein a and b are numbers, the sum of which has an average value of from greater than zero to less than four, b has an average value of from zero to a and R denotes an organic radical bonded to a silicon atom by a silicon-carbon bond, the weight ratio of the water-soluble organopolysiloxane to the water-emulsifiable organopolysiloxane having a value of from 1/99 to 99/1,

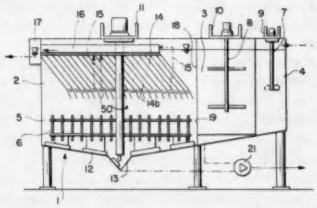
(II) separating the organopolysiloxanes-containing aqueous slurry of fine coal into an aqueous portion and a fine coal portion, said fine coal portion having a water content of less than 20 percent by weight.

4,290,898

METHOD AND APPARATUS FOR MECHANICALLY AND CHEMICALLY TREATING LIQUIDS

Gunter von Hagel, Aarbergen, and Norbert Berlenbach, Wiesbaden-Dotzheim, both of Fed. Rep. of Germany, assignors to Passavant-Werke, Aarbergen, Fed. Rep. of Germany

Continuation of Ser. No. 15,722, Feb. 27, 1979, abandoned, which is a continuation of Ser. No. 309,905, Nov. 27, 1972, Pat. No. 4,142,970, which is a continuation-in-part of Ser. No. 296,775, Oct. 12, 1972, abandoned. This application Apr. 7, 1980, Ser. No. 137,785
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1971, 7138603[U]
The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.
Int. Cl.[3] B01D *21/16*
U.S. Cl. 210—738 26 Claims



1. A method for mechanical or mechanical-chemical treatment of liquids containing pollutants therein by means of destabilization, flocculation, sedimentation and thickening of the pollutants therein, leaving separated essentially solid-free liquid, comprising the steps of: destabilizing the liquid in a separate destabilization compartment, passing the destabilized liquid from the destabilization compartment into a separate flocculation compartment downstream from the destabilization compartment aiding the formation, in the separate flocculation compartment, of settleable flocculated solids, and then passing the liquid from the separate flocculation compartment into a first zone which is a sedimentation zone, dividing the liquid in the first zone into a plurality of parallel flow paths in the form of channels which are inclined, flowing said liquid through said channels and settling out the settleable floccu-

lated solids as the liquid flows through the channels, discharging said solids from the bottom ends of said flow paths so that they fall in a uniformly distributed manner downwardly into a second zone which is a thickening zone, said discharging step including distributing the said solids over an area between 50 and 100% of the area of the top of the second zone, removing the separated solid-free liquid at a location above the bottom ends of said channels to substantially minimize the flow of liquids below the channels so that the discharged solids can fall into the thickening zone with a minimized liquid flow within the thickening zone, thickening the said solids within the thickening zone with mechanical means located in the thickening zone and positioned to contact the said solids as they fall therethrough, and removing the thickened solids out of the said thickening zone with a removing means separate from the thickening means and located below the thickening means.

4,290,899

THERMAL STABILIZER FOR NON-CLAY WELLBORE FLUIDS

Thomas R. Malone, Charleston, WV; Talmage D. Foster, Jr., deceased, late of St. Albans, W. Va., and Sue T. Foster, executrix, Senaca, S.C., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 4, 1979, Ser. No. 885
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 A **10 Claims**

1. In the method of drilling, workover or completion of oil and gas wells using an aqueous polysaccharide solution non-clay well bore fluid, said polysaccharide being a viscosifier and selected from the class consisting of hydroxyalkyl cellulose having 2 to 4 carbons in the alkyl, carboxymethyl hydroxyethyl cellulose, hydroxyalkylated guar gum, xanthan gum or hydroxyethyl carboxyethyl cellulose wherein said wellbore fluid is injected into the wells in contact with the formation, the improvement which comprises incorporating into said solution about 0.5 to about 13% by weight of calcined dolomite, based on the weight of polysaccharide.

4,290,900

METHOD AND COMPOSITION FOR REMOVING ELEMENTAL SULFUR FROM HIGH TEMPERATURE, HIGH PRESSURE WELLS AND FLOW LINES

Shelby P. Sharp, Tulsa, Okla., and Lyman Yarborough, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 29, 1979, Ser. No. 43,517
Int. Cl.³ E21B *43/00*; C23G *5/02*
U.S. Cl. 252—8.55 B **5 Claims**

1. A method of dissolving a deposit of elemental sulfur in a high temperature, high pressure sour gas well, characterized in that a four to twelve carbon atom aliphatic amine activated dialkyl disulfide sulfur solvent will not exist in a liquid phase at bottomhole conditions of said well for sufficient time to effect the removal of said sulfur deposit, involving the steps of:

(a) preparing a relatively nonvolatile, high molecular weight fatty amine activated dialkyl disulfide sulfur solvent capable of existing in a liquid phase at said bottomhole conditions consisting of a dialkyl disulfide to which has been added an amount in excess of 30 parts by weight of a fatty amine, having in excess of twelve carbon atoms, per 100 parts by weight dialkyl disulfide, and

(b) injecting said relatively nonvolatile, high molecular weight fatty amine activated dialkyl disulfide sulfur solvent prepared in step (a) into said sour gas well to dissolve and thus remove said sulfur deposit.

4,290,901

DEMULSIFIER FOR INCLUSION IN INJECTED ACIDIZATION SYSTEMS FOR PETROLEUM FORMATION STIMULATION

Rae A. Royle, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,437
Int. Cl.³ E21B *43/27*
U.S. Cl. 252—8.55 C **5 Claims**

1. In an acidization process wherein an aqueous acidizing solution comprising hydrochloric and hydrofluoric acids is injected through a well into a subterranean petroleum formation, the improvement comprising the addition to the acidizing solution of an effective amount of a demulsifier selected from the group consisting of sorbitan monolaurate, sorbitan monopalmitate, sorbitan monooleate, and mixtures thereof.

4,290,902

OXYMOLYBDENUM DIALKYLDITHIOPHOSPHATES AND LUBRICANTS CONTAINING SAME

Stephen A. Levine, Fishkill, and William R. White, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,680
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E **23 Claims**

1. A compound of the formula:

$$[(RO)_2PS_2]_2Mo_2O_4$$

wherein R is a hydrocarbyl radical having from 1 to 30 carbon atoms, and containing from about 11.7% to about 20.0% of molybdenum.

9. A process of forming a molybdenum-containing compound comprising treating an ammonium or alkali metal molybdate with more than the stoichiometric amount of a concentrated hydrohalic acid required to simply acidify the molybdate salts, at a temperature ranging from ambient to 80° C.; then, adding not more than two moles of dialkyl phosphorodithioic acid for each mole of molybdenum in the molybdate reactant; refluxing the reaction mixture and removing the water of reaction azeotropically.

10. The process of claim **9**, wherein said hydraholic acid is hydrochloric acid and one mole of dialkyl phosphorodithioic acid is added for each mole of molybdenum in said reactant.

4,290,903

PACKAGED FREE FLOWING BLEACH ACTIVATOR PRODUCT

Neil A. Macgilp, Morpeth, and Duncan A. Mann, Fenham, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 20, 1979, Ser. No. 50,236
Claims priority, application United Kingdom, Jun. 26, 1978, 27854/78; Jun. 26, 1978, 27855/78
Int. Cl.³ C11D *17/04, 17/06*
U.S. Cl. 252—91 **4 Claims**

1. Process for preparing free flowing granular bleach activator product comprising the steps of

(a) contacting powdered bleach activator with molten organic compound to form granular product with a particle size ranging from about 1 to about 4 mm maximum dimension, said granular product comprising a matrix of (i) from about 15% to about 70% bleach activator and (ii) from about 85% to about 30% of said organic compound, said bleach activator being selected from the group consisting of tetra acetyl ethylene diamine and tetra acetyl methylene diamine and mixtures thereof, said organic compound being selected from the group consisting of C_{10}–C_{24} primary and secondary alcohol ethoxylates having an average of at least 15 ethylene oxide groups per mole of alcohol, C_8–C_{18} alkyl phenol ethoxylates containing at least 20

ethylene oxide groups per mole of alkyl phenol, polyethylene glycols of molecular weight greater than 4000, and mixtures thereof;

(b) contacting the granules of said granular product with sodium tripolyphosphate particles of size less than 500 microns to provide a surface coating thereon of said sodium tripolyphosphate particles at a level ranging from about 0.1% to about 30% by weight of said matrix;

to thereby provide granular bleach activator product with a flowability defined by a cake strength of less than about 0.9 kg and characterized by a rate of dispersion such that after addition into a standard detergent peroxy bleach solution at least 50% of the organic peroxy bleach theoretically available from the bleach activator is generated within 8 minutes.

4,290,904

TRANSPARENT SOAP

Maxwell H. Poper, Westminster, Calif., and Eric Jungermann, Phoenix, Ariz., assignors to Neutrogena Corporation, Los Angeles, Calif.

Filed Dec. 1, 1980, Ser. No. 211,557

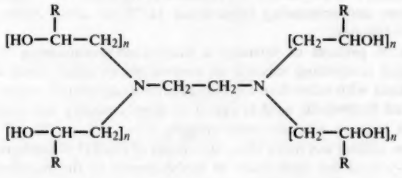
Int. Cl.³ C11D *9/30, 9/48, 10/06, 17/00*

U.S. Cl. 252—118 **34 Claims**

1. A transparent, low alkalinity soap composition in solid form, comprising:

about 10–30 weight percent of a sodium soap prepared by saponification of fatty oils;

about 5–20 weight percent of a tetrakis (hydroxyalkyl) ethylene diamine having the formula



wherein R is hydrogen or an alkyl group having one to four carbon atoms and n is one to four;

a polyhydric alcohol in an amount sufficient to assure transparency; and

a fatty acid superfatting agent.

12. A transparent soap composition in solid form comprising:

about 10–30 weight percent of a sodium soap prepared by saponification of a mixture of tallow, coconut oil and castor oil, said castor oil comprising about 10 to about 30 weight percent of said misture, the weight ratio of tallow to coconut oil being about 50:50 to about 85:15;

about 5–20 weight percent of N,N,N′,N′-tetrakis (2-hydroxypropyl)-ethylenediamine;

about 10–40 weight percent of propylene glycol as solvent for said diamine;

about 6–16 weight percent of superfatting agent comprising stearic acid;

about 5–10 weight percent of an anionic or amphoteric surfactant; and

about 6–15 weight percent of added water.

4,290,905

ESTER COMPOUND

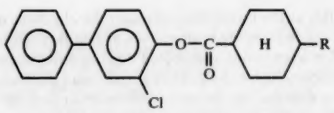
Sadao Kanbe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,002

Int. Cl.³ G02F *1/13;* **C09K** *3/34;* **C07C** *69/74*

U.S. Cl. 252—299.63 **6 Claims**

1. Ester compound useful in liquid crystal displays, said compound having the formula



where R is an n-alkyl group of from 3 to 6 carbon atoms.

3. Liquid crystal composition useful in liquid crystal displays, said composition consisting essentially of

	Percentage by weight of components
4-n-butyl benzoic acid-4′-cyanophenylester	10%
4-n-amyl benzoic acid-4′-cyanophenylester	14%
4-n-heptyl benzoic acid-4′-cyanophenylester	22%
4-n-octyl benzoic acid-4′-cyanophenylester	24%
4-n-amyl benzoic acid-4′-hexyloxyphenylester	10%
4-n-hexyl oxybenzoic acid-4′-n-heptylphenylester	10%
4-n-amyl cyclohexane-1-carboxylic acid-2′-chloro-4′-phenylphenylester	10%

4,290,906

APPARATUS FOR CUTTING CHANNEL BOX FOR FUEL ASSEMBLY AND METHOD THEREFOR

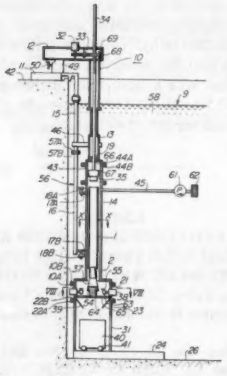
Takashi Saito; Masataka Ohwada, and Shozo Saito, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1979, Ser. No. 64,362

Claims priority, application Japan, Aug. 14, 1978, 53-98189

Int. Cl.³ G21C *19/32;* **G21F** *9/28*

U.S. Cl. 252—301.1 W **14 Claims**



1. Apparatus for cutting a channel box for a fuel assembly, comprising:

guide means having the channel box inserted therein following its removal from the fuel assembly, said channel box being formed with a plurality of axially extending vertexes;

means for pressing against said channel box and for moving said channel box from one end of said guide means to the other end thereof;

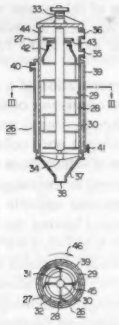
first cutting means axially fixedly mounted for continuously cutting said channel box axially along said vertexes as the channel box is being moved through said guide means; and

second cutting means positioned downstream of said first cutting means in the direction of movement of said channel box for cutting said channel box in a direction intersecting the axis thereof while said channel box is being supported in a condition in which the channel box can be cut axially by said first cutting means.

4,290,907
PROCESS FOR TREATING RADIOACTIVE WASTE

Susumu Horiuchi; Mikio Hirano, both of Hitachi; Hideo Yusa, Katsuta; Koichi Chino, and Tatsuo Hayashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1978, Ser. No. 963,119
Claims priority, application Japan, Nov. 28, 1977, 52/142417
Int. Cl.[3] G21F 9/30
U.S. Cl. 252—301.1 W 5 Claims



1. A process for treating a granular radioactive waste, which comprises:

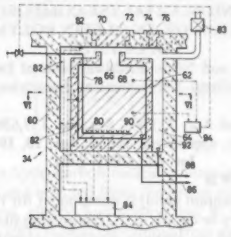
supplying an aqueous slurry of a used radioactive granular, water-insoluble, ion exchange resin discharged from a radioactive material-handling facility into a thin film drier including a shell equipped with a heated wall surface and a rotating shaft having blades that pass closely adjacent to said heated wall surface, and

pressing the radioactive granular, water-insoluble ion exchange resin onto the heated wall surface by moving said blades past said heated wall surface with rotation of said rotating shaft, thereby pulverizing the radioactive granular, water-insoluble, ion exchange resin into a powder.

4,290,908
METHOD AND APPARATUS FOR TREATMENT OF RADIOACTIVE WASTES

Susumu Horiuchi, Hitachi; Takashi Taniguchi, Mito; Masaki Takeshima; Mikio Hirano, both of Hitachi, and Hideo Yusa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1979, Ser. No. 55,151
Claims priority, application Japan, Jul. 19, 1978, 53-88657
Int. Cl.[3] G21F 5/00, 7/06, 9/00
U.S. Cl. 252—301.1 W 16 Claims



1. An apparatus for the treatment of radioactive wastes, which comprises a drying device for drying and powdering a radioactive waste discharged from a source of wet radioactive waste material, a granulator for pelletizing the powder of the radioactive waste, a storage means for temporarily storing a large mass of the initially formed pellets for a predetermined period for attenuating the radioactivity of the pellets, said storage means including shielding means for preventing leakage of radioactivity into the atmosphere surrounding said storage means, a pellet transporting means for transporting the initially formed pellets from the granulator to the storage means, with the amount of pellets being transported being controlled so that the surface dose of radioactivity of the transported pellets is maintained at a predetermined allowable level, a sealing vessel for packing a smaller mass of the radioactivity-attenuated pellets together with a binder, and a pellet treating device for taking out the smaller mass of the pellets from the storage means and transporting the smaller mass of pellets into the sealing vessel.

4,290,909
PROCESS FOR PRODUCING A LITHIUM BORATE THERMOLUMINESCENT AND FLUORESCENT SUBSTANCE

Mutsuo Takenaga, Katano, and Osamu Yamamoto, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1979, Ser. No. 61,999
Claims priority, application Japan, Aug. 3, 1978, 53-95322
Int. Cl.[3] C09K 11/28
U.S. Cl. 252—301.4 R 7 Claims

1. Process for producing a lithium borate ($Li_2B_4O_7$) thermoluminescent and fluorescent substance of substantially spherical form containing lithium borate ($Li_2B_4O_7$) as the main component which comprises mixing $Li_2B_4O_7$ powder with an activator element compound and heat-treating the resultant mixture in air at a temperature of about 850° C. to just below the melting point of $Li_2B_4O_7$ for a time sufficient to diffuse the activator element into the crystal interior of the $Li_2B_4O_7$ powder and effect formation of $Li_2B_4O_7$ thermoluminescent substance of substantially spherical form.

4,290,910
FATTY EMULSION AND PROCESS FOR THE PREPARATION THEREOF

Kiyoshi Harada, Kyoto; Yoshiyuki Koida, Katano, and Hiroshi Miura, Takatuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Aug. 30, 1979, Ser. No. 71,041
Claims priority, application Japan, Sep. 8, 1978, 53/111089
Int. Cl.[3] B01J 13/00
U.S. Cl. 252—312 24 Claims

1. A fatty emulsion comprising an oil-in-water type fatty emulsion which is regulated to a pH value of 6.0 to 8.0 with a pH value regulator consisting of a combination of at least one organic amine selected from the group consisting of lysine, arginine, ornithine, histidine, trishydroxymethylaminomethane and triethanolamine and at least one buffer solution selected from the group consisting of a potassium dihydrogen phosphate-dipotassium hydrogen phosphate buffer, potassium dihydrogen phosphate-disodium hydrogen phosphate, potassium dihydrogen phosphate-trisodium phosphate, sodium dihydrogen phosphate-disodium hydrogen phosphate, citric acid-disodium hydrogen phosphate, and tris-HCl.

4,290,911
AGAROSE COMPOSITION, AQUEOUS GEL AND METHOD OF MAKING SAME

Richard B. Cook, Rockland, and Henry J. Witt, Rockport, both of Me., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 7, 1979, Ser. No. 10,033
Int. Cl.[3] B01J 13/00; B01D 57/02
U.S. Cl. 252—316 8 Claims

1. A dry solid composition capable of forming an aqueous gel free from electroendosmosis and suitable for use as a medium for isoelectric focusing, said composition consisting es-

sentially of a blend of purified agarose having an electroendosmosis value (−Mr) less than 0.10 in an amount from 2 to 99% by weight and a gum soluble in boiling water without gelling, said gum being free from hull fragments and other impurities interfering with staining, free from charged groups and stable against hydrolysis which forms charged groups, and soluble by itself in water to form a solution of gum having a viscosity at a concentration no greater than 10% by weight of at least 10 cps at 25° C., said gum being clarified locust bean gum, clarified guar gum, polyvinyl alcohol or dextran.

2. An aqueous gel free from electroendosmosis having a gel strength of at least 100 g/cm^2 and suitable for use as a medium for isoelectric focusing consisting essentially of a gelled solution in water of the composition claimed in claim 1, the amount of said composition present being from 0.2 to 10% by weight of the water.

4,290,912

VOLATILE CORROSION INHIBITING ARTICLE

Fred P. Boerwinkle, St. Paul, Minn., and Donald A. Kubik, Somerset, Wis., assignors to Northern Instruments Corporation, Lino Lakes, Minn.

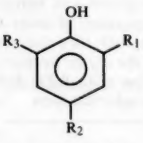
Filed Feb. 21, 1980, Ser. No. 123,395
Int. Cl.^{3} C23F *11/02, 11/12, 11/18*
U.S. Cl. 252—389 R **7 Claims**

1. An article having volatile corrosion inhibiting properties comprising

(a) a polyolefin polymer

(b) an inorganic nitrite salt

(c) a phenol of the formula



where R_1, R_2 and R_3 are selected from alkyl, aryl, alkenyl, hydroxyalkyl, hydroxyalkenyl and where the sum of carbon atoms in R_1, R_2 and R_3 is in the range of 3 and about 18, and

(d) fumed silica.

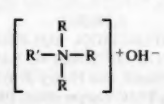
4,290,913

CATALYTIC COMPOSITE USEFUL FOR THE TREATMENT OF MERCAPTAN-CONTAINING SOUR PETROLEUM DISTILLATE

Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 927,318, Feb. 24, 1978, Pat. No. 4,124,493. This application Nov. 7, 1979, Ser. No. 91,929
The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.
Int. Cl.^{3} B01J *23/04, 31/18*
U.S. Cl. 252—428 **11 Claims**

1. A catalytic composite comprising a metal chelate, an alkali metal hydroxide, and a quaternary ammonium hydroxide disposed on an adsorptive support, the quaternary ammonium hydroxide represented by the structural formula



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl and R' is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, said alkali metal hydroxide comprising at least about 10 wt. % of said catalytic composite.

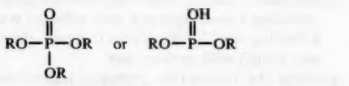
4,290,914

CATALYTIC MATERIALS AS FOR OLEFIN POLYMERIZATION

Stanley J. Katzen, Cincinnati, and Louis J. Rekers, Wyoming, both of Ohio, assignors to National Petro Chemicals Corp., New York, N.Y.

Continuation of Ser. No. 923,111, Jul. 10, 1978, abandoned, which is a division of Ser. No. 759,213, , and a continuation-in-part of Ser. No. 759,213, Jan. 13, 1977, Pat. No. 4,100,104. This application Jun. 16, 1980, Ser. No. 159,992
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.^{3} C08F *4/78;* B01J *31/14, 21/12*
U.S. Cl. 252—428 **2 Claims**

1. A process for the preparation of a catalyst material comprising coating a xerogel consisting of silica as the major constituent and having surface hydroxyl groups, a surface area in the range of 200 to 500 m^2/g, a pore volume greater than about 2.0 cc/g, a major portion of which pore volume is provided by pores having pore diameters in the range of from 300 to 600 A with an aluminum compound capable of reacting with said surface hydroxyl groups and having the formula $Al(X)_a(OR)_b$, wherein X is R, a is 0–2, b is 1–3, a+b is 3, and R is an alkyl group having from 1 to 8 carbon atoms in an amount sufficient to provide from about 0.1 to 10% of aluminum by weight based on the weight of the xerogel, calcining the support material having the aluminum compound thereon at temperatures of at least 200° F., depositing on the aluminum coated calcined material an organophosphoryl chromium reaction product of chromium trioxide and an organophosphorus compound of the formula:



wherein R is hydrogen, or alkyl, aralkyl, aryl, or cycloalkyl, but al least one R is other than hydrogen in an amount sufficient to provide from about 0.25 to 2.5% of chromium by weight based on the weight of the Xerogel; and activating the thus treated support in a non-reducing atmosphere at temperatures of from 1550° F. and up to the decomposition temperature of the support, said activating temperature being in excess of said calcining temperature.

2. The process according to claim 1, wherein the activation is carried out at a temperature of from about 1550° F. to 1800° F.

4,290,915

SOLID TITANIUM CATALYST COMPOSITION FOR PRODUCTION OF AN OLEFIN POLYMER OR COPOLYMER

Akinori Toyota, and Norio Kashiwa, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,638
Claims priority, application Japan, Apr. 10, 1979, 54-42494
Int. Cl.^{3} C08F *4/64*
U.S. Cl. 252—429 B **5 Claims**

1. In a solid titanium catalyst component for the production of olefin polymers or copolymers, comprising titanium, magnesium, halogen and an electron donor as essential ingredients and further containing an inert liquid hydrocarbon, the improvement wherein the liquid hydrocarbon is present in an amount of, based on the weight of said component, about 1 to about 10% when said component has a uniformity coefficient of at least 4, and about 1 to about 25% when said component has a uniformity coefficient of less than 4.

4,290,916

CATALYTIC COMPOSITE, METHOD OF MANUFACTURE, AND PROCESS FOR USE

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

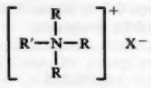
Continuation-in-part of Ser. No. 80,638, Oct. 1, 1979. This application Jan. 14, 1980, Ser. No. 111,752

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.[3] B01J *31/32*

U.S. Cl. 252—430 26 Claims

1. A method of manufacture of a catalytic composite which comprises contacting a molecular sieve support with a substituted ammonium compound represented by the structural formula:



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hydroxide, drying the resulting composite, thereafter contacting the resulting composite with a metal chelate and with an alkali metal hydroxide, said alkali metal hydroxide being in a weight ratio with said molecular sieve support from about 0.1:1 to about 1:1, and thereafter drying the resulting catalytic composite.

4,290,917

METHOD OF MANUFACTURING A CATALYTIC COMPOSITE

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

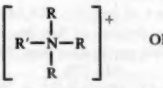
Continuation-in-part of Ser. No. 80,638, Oct. 1, 1979. This application Jan. 14, 1980, Ser. No. 111,757

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.[3] B01J *31/22*

U.S. Cl. 252—430 12 Claims

1. A method of manufacture of a catalytic composite which comprises contacting an adsorptive support with a substituted ammonium compound represented by the structural formula:



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl and R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, drying the resulting composite, thereafter contacting the resulting composite with a metal chelate and with an alkali metal hydroxide, said alkali metal hydroxide being in a weight ratio with said adsorptive support from about 0.1:1 to about 1:1, and thereafter drying the resulting catalytic composite.

4,290,918

SOLUBLE POLYMERIZATION CATALYSTS, PRODUCTION OF THE SAME AND THEIR USE

Ernst Bayer, and Mohamed Kutubuddin, both of Tubingen, Fed. Rep. of Germany, assignors to Heyl & Co., Chemisch-Pharmazeutische Fabrik, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,679

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2835944

Int. Cl.[3] B01J *31/12*

U.S. Cl. 252—431 R 8 Claims

1. As a soluble catalyst for polymerization reactions, an organic polymer having at least one functional group bound to a metal component and having a molecular weight of 1000–10,000,000, wherein the organic polymer is a polystyrene, polyvinyl alcohol, polyvinyl ether, polyvinyl amine, polyacrylic acid, polymethacrylic acid, polyvinyl pyrrolidone, polyethylene glycol, polypropylene glycol, polyethylene imine, polyurethane, polyester or mixed polymerisate of mixed condensate of the corresponding monomer, and wherein the metal component is at least one of the metals selected from the group consisting of Ti, U, V, Zr, Co, Ni, Cr, Mo, W, Al, Zn and Fe.

4,290,919

CRACKING CATALYSTS PASSIVATED BY TUNGSTEN

Dwight L. McKay; Brent J. Bertus, and Harold W. Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartiesville, Okla.

Filed Jul. 23, 1979, Ser. No. 59,839

Int. Cl.[3] C10G *11/05*

U.S. Cl. 252—437 6 Claims

6. A modified cracking catalyst obtained by contacting a zeolite-modified silica-alumina cracking catalyst and at least one passivating compound containing tungsten and phosphorus, under elevated temperature conditions.

4,290,920

SB-CONTAINING CATALYSTS BY SB-OXIDE IMPREGNATION

Dev D. Suresh, Macedonia; James F. Brazdil, Lyndhurst, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 107,942

Int. Cl.[3] B01J *27/02, 23/10, 23/84, 23/64*

U.S. Cl. 252—439 17 Claims

1. A process for improving the catalytic performance of a used antimony-containing oxide complex catalyst comprising adding to said catalyst an antimony-containing compound in an amount such that the amount of antimony added to said catalyst is 0.1 to 25% based on the antimony in said catalyst.

4,290,921

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 965,372, Nov. 30, 1978, Pat. No. 4,197,188, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Mar. 17, 1980, Ser. No. 130,655

The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.[3] B01J *27/08, 27/10, 23/64*

U.S. Cl. 252—441 18 Claims

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation of the rhenium carbonyl component, and of a zirconium component.

4,290,922

AMMOXIDATION CATALYST FOR THE PRODUCTION OF ACRYLONITRILE FROM PROPYLENE AND PROCESS FOR PRODUCING THE SAME

Sumio Umemura; Kyoji Ohdan; Mikio Hidaka, and Toshio Kurafuji, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Mar. 26, 1980, Ser. No. 134,053

Claims priority, application Japan, Apr. 18, 1979, 54/46728

Int. Cl.[3] B01J *21/06, 23/24*

U.S. Cl. 252—456 **8 Claims**

1. A catalyst for producing acrylonitrile by the catalytic ammoxidation of propylene, said catalyst comprising an oxide composition of the empirical formula (I):

$$Mo_aCo_bNi_cFe_dBi_eV_fCa_gK_hX_iSi_jO_k \quad (I)$$

wherein X represents at least one element selected from the group consisting of zirconium and chromium, the subscripts a, b, c, d, e, f, g, h, i and j respectively denote the number of the respective atoms of the elements, and the ratio a:b:c:d:e:f:g:h:i:j is in a range of 10:0 to 8:0 to 8:0.3 to 7:0.01 to 3:0.01 to 2:0.01 to 5:0.05 to 0.5:0 to 2:10 to 50, the ratio a:(b+c) being in a range of 10:2 to 10, and the subscript k denotes the number of oxygen atoms which satisfies the average valency of the elements other than oxygen, the ratio a:k being in a range of 10:30 to 80, and said catalyst is prepared by

(a) mixing an aqueous liquid with (1) a molybdenum-containing compound, (2) at least one member selected from cobalt- and nickel-containing compounds, (3) an iron-containing compound, (4) a bismuth-containing compound, (5) a vanadium-containing compound, (6) a calcium-containing compound, (7) a potassium-containing compound, (8) at least one member selected from zirconium- and chromium-containing compounds, and (9) a silicon-containing compound, each in an amount sufficient to satisfy the abovespecified atomic ratio of the elements in the empirical formula (I), to prepare an aqueous slurry, said aqueous slurry containing not more than 15% of the sum of the respective element-containing compounds, which are in the form of solid particles having a size of 2 microns or less, based on the entire weight of said aqueous slurry, and having a pH of 1.0 or less;

(b) spray drying said aqueous slurry to form a dried solid precursor catalyst, and

(c) calcining said precursor catalyst at a temperature of from 500° to 750° C. to prepare an activated catalyst.

4,290,923

RARE-EARTH-MANGANESE OXIDATION CATALYSTS AND PROCESS OF PRODUCING SAME

Peter G. Mein, and Arno H. Reidies, both of La Salle, Ill., assignors to Carus Corporation, LaSalle, Ill.

Continuation-in-part of Ser. No. 8,591, Feb. 1, 1979, abandoned. This application Feb. 4, 1980, Ser. No. 118,553

Int. Cl.[3] B01J *23/10, 23/34*

U.S. Cl. 252—462 **24 Claims**

1. The process of producing a rare earth-manganese oxidation catalyst by ion exchange reaction, comprising the steps of:

(a) forming a suspension of finely-divided alkali metal delta manganese dioxide hydrate in an aqueous solution containing rare earth metal salt ions, said suspension having an initial pH of from 5.0 to 7.0, the rare earth metal ions being provided by one or more rare earths of the ceria subgroup;

(b) exchanging the alkali of said alkali metal manganese dioxide hydrate with said rare earth metal ions at a temperature of at least 30° C. and under acidic pH conditions;

(c) continuing said exchanging reaction until the manganese reaction product contains not over 0.05 moles of bound alkali metal per mole of manganese and at least one mole of total ceria subgroup rare earth metal per 5 to 7 moles of manganese;

(d) separating said reaction product from said aqueous solution; and

(e) preparing dried porous catalytic pellets from said reaction product.

4,290,924

CATALYST COMPOSITION USEFUL FOR PREPARING 2,6-XYLENOL

Bruce E. Leach, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Division of Ser. No. 45,571, Jun. 4, 1979, Pat. No. 4,227,024. This application Apr. 4, 1980, Ser. No. 137,195

Int. Cl.[3] B01J *23/78, 23/82, 23/86*

U.S. Cl. 252—469 **5 Claims**

1. A catalyst composition consisting essentially of the following materials in percent by weight: Fe_2O_3—about 90 to about 97; SnO_2—about 0.5 to about 5; Cr_2O_3—about 0.5 to about 5; K_2O—about 0.01 to about 1.

4,290,925

LUBRICATING OIL ADDITIVES

Horst Pennewiss, Darmstadt-Neu-Kranichstein; Rainer Benda, Rossdorf; Heinz Jost, Modautal, and Helmuth Knoell, Lautertal, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,449

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905954

Int. Cl.[3] C10M *1/26, 1/18, 3/20, 3/12*

U.S. Cl. 252—56 S **11 Claims**

1. A concentrated polymer emulsion useful as a lubricating oil additive for improving the viscosity index thereof, said emulsion comprising:

(1) a dispersed phase of an olefinic copolymer having a molecular weight complementary with respect to the thickening effect desired;

(2) a dispersing phase of a polymer predominantly comprising at least one member selected from the group consisting of acrylate ester and methacrylate ester monomers;

(3) a vehicle which is a good solvent for the esters in said dispersing phase and a substantially less good solvent for the olefinic copolymer by virtue of the esters dissolved in said vehicle; and

(4) an emulsifier, stabilizing phase distribution, which is a member selected from the group consisting of graft copolymers and block copolymers formed from olefinic monomers and at least one member selected from the group consisting of acrylate ester and methacrylate ester monomers.

4,290,926

NON-HALOGENATED IMPREGNANT FOR CAPACITORS COMPRISING AN AROMATIC CARBOXYLIC ACID ESTER AND AN ALKENE

David G. Shaw, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 784,143, Apr. 4, 1977, abandoned, which is a division of Ser. No. 669,755, Mar. 24, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,770

Int. Cl.[3] H01B *3/22, 3/20*

U.S. Cl. 252—579 **11 Claims**

1. A composition for use as a dielectric liquid under stress in an electrical apparatus comprising

a. a dielectric liquid aromatic carboxylic ester which is hydrogen gas absorbing at a temperature between 40° and 100° C., and

b. 5 to 30 percent by volume of an alpha unsaturated alkene normally liquid at room temperature dissolved therein, said alkene containing from 10 to less than 20 carbon atoms and having a significantly higher hydrogen gas absorbing value than the dielectric liquid aromatic ester,

c. said composition being essentially halogen free.

4,290,927

VULCANIZABLE POLYBLEND

Chiaki Tanaka, Chita; Masanobu Morikawa, Nagoya, and Yoshio Kohno, Okazaki, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 585, Jan. 2, 1979, abandoned, which is a continuation of Ser. No. 745,928, Nov. 29, 1976, abandoned.

This application Apr. 16, 1980, Ser. No. 140,888

Claims priority, application Japan, Nov. 27, 1975, 50/141175; Nov. 27, 1975, 50/141176

Int. Cl.³ C08L *7/00, 67/06*

U.S. Cl. 260—3 **13 Claims**

1. A vulcanizable polyblend which comprises an intimate mixture of about 5 to 90% by weight of a thermoplastic polyester which is a condensation polymer prepared from a dicarboxylic acid and a glycol component comprising at least 50 mol percent of 1,4-butanediol, the remainder of said glycol component being selected from the group consisting of ethylene glycol, propanediols, 1,6-hexanediol, xylylene glycol, cyclohexane dimethanol and 1,4-cyclohexanediol; said polyblend also comprising 95 to 10% by weight of a vulcanizable rubber.

12. A vulcanizable polyblend as defined in claim **1** wherein the rubber comprises natural rubber.

4,290,928

BINDER FOR DRY HOT COAT FOUNDRY PROCESS

Kyohei Funabiki; Noriaki Matsushima, and Naomitsu Inouye, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Division of Ser. No. 865,558, Dec. 29, 1977, Pat. No. 4,196,114.

This application Mar. 21, 1980, Ser. No. 132,599

Claims priority, application Japan, Aug. 4, 1977, 52/90950

Int. Cl.³ C08L *61/10*

U.S. Cl. 260—28 P **17 Claims**

1. A lubricant-containing binder for the dry hot coat foundry method consisting essentially of a solid resol-type phenolic resin produced by the reaction comprising condensation of reactants consisting of a phenol and a formaldehyde source followed by dehydration of the reaction mixture, and a lubricant in an amount of about 0.5 to 10 percent by weight with respect to said phenolic resin, wherein said lubricant is added prior to or during the course of the reaction to produce said solid resol-type phenolic resin.

11. A process for producing resin-coated sand for use in a shell mold which comprises coating heated sand particles with a lubricant containing binder comprising a solid resol-type phenolic resin produced by the reaction comprising condensation of reactants consisting of a phenol and a formaldehyde source followed by dehydration of the reaction mixture, and a lubricant in an amount of about 0.5 to 10 percent by weight with respect to said phenolic resin, wherein said lubricant is added after the condensation step, but before the dehydration step of the reaction to produce said solid resol-type phenolic resin.

4,290,929

AQUEOUS SOLUTIONS OF POLYESTERIMIDES AND METHODS OF MAKING THE SAME

Charles W. McGregor; Joseph Karkoski, both of Fort Wayne, Ind., and John D. Shurboff, Coral Springs, Fla., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jul. 13, 1979, Ser. No. 57,521

Int. Cl.³ C08L *79/08*

U.S. Cl. 260—29.2 N **13 Claims**

1. A process of producing an aqueous solution of a polyesterimide having a weight average molecular weight of 16,000 to 600,000, an acid number less than 2 and consisting of a tricarboxylic acid anhydride component, a diamine component, an ester component, and a polycarboxylic cross-link material, comprising:

mixing the polyesterimide with a low boiling amine solubilizing agent of K_b less than 10^{-5}, heating the mixture until an acid number greater than 50 is attained, and diluting with water to attain a viscosity at 30° C. less than 2,500 cps and a polymer solids content greater than 30% by weight.

4,290,930

AQUEOUS VINYL PLASTICS DISPERSION CONTAINING WATER SOLUBLE SALT OF POLYBASIC PHOSPHONIC ACID DERIVATIVE

Ernst Nölken, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,732

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810348

Int. Cl.³ C08K *5/50*

U.S. Cl. 260—29.6 MP **8 Claims**

1. An aqueous dispersion of vinyl polymer plastic containing 0.005 to 5% by weight, calculated on the total amount of vinyl monomer(s), of a water-soluble salt of a polybasic phosphonic acid derivative having two to four phosphorus atoms wherein said dispersion contains polymer particles with an average diameter of 0.05 to 5.0 μm.

4,290,931

AQUEOUS PLASTICS DISPERSION ON THE BASIS OF VINYL ESTER POLYMERS, PROCESS FOR THE MANUFACTURE THEREOF, AND COATING MATERIAL MADE THEREFROM

Ernst Nölken, and Hans G. Oesterlin, both of Bad Soden am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 42,089

Claims priority, application Fed. Rep. of Germany, May 29, 1978, 2823301

Int. Cl.³ C08K *5/53*

U.S. Cl. 260—29.6 RW **17 Claims**

1. In an aqueous plastics dispersion having a base of a vinyl ester polymer:

a water-soluble salt of a copolymer of styrene and maleic acid anhydride, semiester or semiamide, the copolymer containing styrene units and comonomer units in a ratio of from 1.5:1 to 6:1,

a hydroxy group-containing polyether which under normal conditions is liquid or water soluble, and

a dispersing agent of a monophosphono-alkane compound of the formula

wherein R is alkyl of 6 to 24 carbon atoms, unsubstituted or substituted by a phenyl, hydroxyl or carboxyl.

4,290,932

ACRYLIC RESIN-ACRYLIC MICROGEL COMPOSITIONS

Howard J. Wright, Kansas City, Mo.; David P. Leonard, Overland Park, Kans., and Roger A. Etzell, Gladstone, Mo., assignors to Cook Paint and Varnish Company, Kansas City, Mo.

Filed Nov. 27, 1979, Ser. No. 98,115

Int. Cl.³ C08L *33/14*

U.S. Cl. 260—29.6 WB **8 Claims**

1. A method of making an acrylic microgel resin for use in paint systems to provide coatings of improved pigment orientation and sag resistance which comprises preparing an aqueous microgel emulsion by the emulsion polymerization in

water of a mixture of ethylenically unsaturated monomers, at least one of said monomers being an acrylic or methacrylic acid, or an —OH substituted alkyl ester thereof, and containing a —COOH or —OH group, and at least another of said monomers being selected from an alkyl ester of an acrylic or methacrylic acid, styrene and alpha-methyl styrene, and being free from —COOH and —OH groups, and a multifunctional crosslinking agent present in an amount of 5–70 percent by weight of the total weight of said ethylenically unsaturated monomers and crosslinking agent, removing water from the emulsion by coagulation and/or azeotropic distillation with an organic solvent in which the microgel is insoluble and which forms an azeotrope with water, and incorporating the microgel into an acrylic resin prepared by polymerizing two or more ethylenically unsaturated monomers in an organic solvent solution wherein at least one of said monomers is an —OH substituted alkyl ester of an acrylic or methacrylic acid and optionally a monomer containing a —COOH group selected from an acrylic or methacrylic acid, and another of said monomers being selected from an alkyl ester of an acrylic or methacrylic acid, styrene and alpha-methyl styrene, and being free from —COOH and —OH groups to provide said acrylic microgel resin wherein the amount of microgel solids is in the range of 5 to 15 percent by weight of the total resin solids.

4,290,933

ADHESIVE COMPOSITION FOR MAKING FORM SETS FROM CARBONLESS COPY PAPER SHEETS

William J. Becker, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Continuation of Ser. No. 928,143, Jul. 26, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 139,116

Int. Cl.³ C08K *3/38*

U.S. Cl. 260—29.6 MM **5 Claims**

1. An adhesive composition for making form sets from carbonless copy paper sheets consisting essentially of:

(a) an acrylic polymer latex emulsion,

(b) at least one water-miscible organic solvent, and

(c) sodium tetraborate decahydrate.

4,290,934

PLASTICIZED POLYCARBONATE COMPOSITION

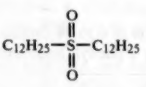
Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jun. 29, 1977, Ser. No. 811,064

Int. Cl.³ C08K *5/41*

U.S. Cl. 260—30.8 R **3 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer having the following formula:



4,290,935

HIGHLY RIGID POLYAMIDE COMPOSITION

Toshio Muraki, Nagoya, Japan, assignor to Toray Industries, Incorporated, Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 88,386

Claims priority, application Japan, Oct. 27, 1978, 53-131562; Feb. 8, 1979, 54-13729

Int. Cl.³ C08K *5/20*

U.S. Cl. 260—32.6 NA **14 Claims**

1. A highly rigid polyamide which comprises poly-ε-caprolactam containing about 50 to 5000 ppm of combined barium, said barium combined with the poly-ε-caprolactam, and having a γ-type crystal ratio of about 0.3 to 0.7 in the crystalline phase.

4,290,936

PROCESS FOR PREPARING POLYIMIDE SOLUTION

Yoshikazu Sasaki, Takatsuki; Hiroshi Inoue, Hirakata; Ichiro Sasaki, Chiba; Hiroshi Itatani, Chiba, and Mikito Kashima, Chiba, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Nov. 8, 1979, Ser. No. 92,508

Claims priority, application Japan, Nov. 9, 1978, 53-137356; Sep. 6, 1979, 59113558

Int. Cl.³ C08K *5/13*

U.S. Cl. 260—33.4 P **11 Claims**

1. A process for preparing a polyimide solution, which comprises the step of polymerizing ingredients consisting essentially of:

(A) a tetracarboxylic acid ingredient consisting of, based on the tetracarboxylic acid ingredient,

(a) approximately 80 to 100% by mole of 3,3',4,4'-biphenyltetracarboxylic acid or its functional derivative and

(b) 0 to 20% by mole of at least one compound selected from the group consisting of 2,3,3',4'-biphenyltetracarboxylic acid, 2,2',3,3'-biphenyltetracarboxylic acid, 3,3',4,4'-benzophenonetetracarboxylic acid, bis(3,4-dicarboxyphenyl) methane, 2,2-bis-(3,4-dicarboxyphenyl) propane, bis(3,4-dicarboxyphenyl) ether, bis(3,4-dicarboxyphenyl)thioether, bis(3,4-dicarboxyphenyl) sulfone, 2,3,6,7-naphthalenetetracarboxylic acid, pyromellitic acid and functional derivatives thereof, and

(B) an aromatic diamine ingredient containing at least approximately 50% by mole, based on the aromatic diamine ingredient, of 4,4'-diaminodiphenyl ether, at a temperature of from approximately 100° to 300° C. in phenol or a halogenated phenolic compound; the amounts of the tetracarboxylic acid ingredient and the aromatic diamine ingredient being approximately equimolar to each other; whereby the tetracarboxylic acid ingredient and the aromatic diamine ingredient are polymerized, while being accompanied by imidation, to produce a homogeneous polyimide solution containing a polyimide having a logarithmic viscosity of from 0.7 to 6, as measured at 50° C., on a solution of 0.5 g polymer in 100 ml of p-chlorophenol.

4,290,937

THERMOPLASTIC MOLDING COMPOSITIONS

Stuart C. Cohen, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 866,008, Dec. 30, 1977, Pat. No. 4,185,047. This application May 29, 1979, Ser. No. 43,218

Int. Cl.³ C08L *67/02*

U.S. Cl. 260—40 R **5 Claims**

1. An improved molding composition having improved mold releasability, said composition consisting essentially of:

(a) poly(1,4-butylene terephthalate);

(b) from about 0.25 to 4.5 percent by weight, based on the total composition, of polyethylene or an olefin-based copolymer selected from propylene-ethylene copolymer, ethylene-vinyl acetate copolymer, ethylene-acrylic acid copolymer or mixtures thereof; and

(c) from about 0.02 to about 0.5% by weight, based on the total composition, of talc.

4,290,938
THERMOSETTING INJECTION MOLDING COMPOUND

Hideo Miyake; Junichi Sakamoto, both of Otsu; Masakazu Sawaki, Kyoto, and Mamoru Hara, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha Co., Ltd., Japan

Filed Jan. 4, 1980, Ser. No. 109,736

Claims priority, application Japan, Jan. 5, 1979, 54-859

Int. Cl.³ C08K *3/40;* **C08L** *67/06*

U.S. Cl. 260—40 R **8 Claims**

1. A thermosetting injection molding compound which comprises

(A) crystalline unsaturated polyester which comprises (A) a crystalline unsaturated polyester consisting of acid components: terephthalic acid/fumaric acid=5/5 to 1/9 by mol and glycol components: 1,4-butanediol/other glycol=7/3 to 10/0 by mol, and having a Gardner-holdt bubble viscosity of N to W (measured in a 70% by weight solution in tetrachloroethane at 25° C.), a melting point of 50° to 130° C. and an acid value of not more than 20, and (B) at least one monomer selected from the group consisting of a styrene type monomer and an allyl type monomer;

(C) a glass fiber; and

(D) an additive selected from the group consisting of a filling agent, a fire retardant agent, a releasing agent, a colorant, a polymerization initiator and a polymerization inhibitor;

said components being incorporated in the ratios of B/(A+B)=5 to 40% by weight, C(A+B+C+D)=5 to 30% by weight, and (C+D)/(A+B)=90/10 to 40/60 by weight;

and said molding compound having an extension in a disc flow test of 80 to 110 mm.

4,290,939
UNSATURATED POLYESTER RESINS AND MOLDING COMPOSITIONS CONTAINING SAME

Robert J. Bertsch, Brecksville, and Changkiu K. Riew, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 27, 1980, Ser. No. 134,371

Int. Cl.³ C08L *67/02;* **C08G** *63/20*

U.S. Cl. 260—40 R **24 Claims**

13. Molding composition comprising polyester resin and a particulate filler, said polyester resin being the reaction of an acid and/or anhydride with a hydroxyl-containing compound which forms ester groups upon reaction with the acid and/or anhydride, the improvement comprising co-reacting a carboxyl or a hydroxyl terminated liquid polymer with said acid or anhydride and the hydroxyl containing compound.

4,290,940
PYRROLE STABILIZERS FOR CHLORINE-CONTAINING THERMOPLASTICS

Hermann O. Wirth; Jürgen Büssing, both of Bensheim, and Hans-Helmut Friedrich, Lautertal, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

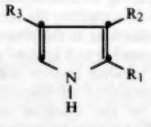
Filed Jun. 30, 1980, Ser. No. 164,194

Claims priority, application Switzerland, Jun. 28, 1979, 6035/79

Int. Cl.³ C07D *207/32, 207/333;* **C08K** *5/34*

U.S. Cl. 260—45.8 N **13 Claims**

1. A chlorine-containing thermoplastic, containing a pyrrole of the formula I



(I)

in which R_1 is hydrogen, alkyl, cycloalkyl, aryl, alkoxycarbonylmethyl, free or esterified α-hydroxyalkyl, free or esterified α-hydroxycycloalkylmethyl, free or esterified α-hydroxyaralkyl, alkoxymethyl, alkylthiomethyl, aryloxymethyl, arylthiomethyl, cycloalkoxymethyl, cycloalkylthiomethyl, aralkoxymethyl, aralkylthiomethyl, alkoxy, alkylthio, cycloalkoxy, cycloalkylthio, aralkoxy, arylalkylthio, aryloxy, arylthio, halogen, mercapto, mercaptomethyl or hydroxyl, R_2 is hydrogen, alkyl, cycloalkyl, aryl, free or esterified α-hydroxyalkyl, in which the alkyl moiety together with R_1 can be alkylene, or free or esterified α-hydroxycycloalkylmethyl, free or esterified α-hydroxyaralkyl, alkoxy, cycloalkoxy, aralkoxy, aryloxy, alkylthio, cycloalkylthio, aralkylthio, arylthio, alkoxymethyl, alkylthiomethyl, aryloxymethyl, arylthiomethyl, cycloalkoxymethyl, cycloalkylthiomethyl, aralkoxymethyl, aralkylthiomethyl, hydroxyl, cyano, free carboxyl or carboxyl in the form of a salt or an ester, or acyl, it being possible for acyl together with R_1 to be —CO-alkylene, in which —CO— is bonded in the 3-position, or R_2 is halogen, mercapto or mercaptomethyl, and R_3 is alkyl, cycloalkyl, aralkyl, aryl, free or esterified hydroxymethyl, alkoxymethyl, alkylthiomethyl, cycloalkoxymethyl, cycloalkylthiomethyl, aralkoxymethyl, arylalkylthiomethyl, aryloxymethyl or arylthiomethyl, alkoxy, alkylthio, cycloalkoxy, cycloalkylthio, aralkoxy, aralkylthio, aryloxy, arylthio, halogen, mercapto or mercaptomethyl, or if R_2 is carboxyl in the form of a salt, R_3 is hydrogen and R_1 is as defined, or in which R_3 is hydroxyl and R_1 is hydrogen, alkyl or aryl and R_2 is hydrogen, alkyl, aryl or acyl, or a salt thereof.

4,290,941
STABILIZATION SYSTEMS FROM TRIARYLPHOSPHITES AND PHENOLS

Horst Zinke, Ernsthofen; Hans J. Lorenz, Bensheim-Auerbach, both of Fed. Rep. of Germany, and Helmut Linhart, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

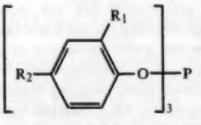
Continuation of Ser. No. 802,921, Jun. 2, 1977, Pat. No. 4,187,212, which is a continuation of Ser. No. 658,312, Feb. 17, 1976, abandoned. This application Aug. 24, 1979, Ser. No. 69,480

Claims priority, application Switzerland, Feb. 20, 1975, 2155/75; Sep. 19, 1975, 12231/75

Int. Cl.³ C08K *5/52*

U.S. Cl. 260—45.85 B **12 Claims**

1. A stabilized composition consisting essentially of (a) a polymer that is derived from a singly unsaturated acyclic hydrocarbon, or mixtures or copolymers thereof; and (b) from 0.005 to 5% of a mixture of (1) a triarylphosphite of the general formula



wherein R_1 is tert.butyl or 1,1-dimethylpropyl, and R_2 is methyl, tert.butyl or 1,1-dimethylpropyl, and (2) a hindered phenolic antioxidant selected from the group consisting of 2,6-di-tert.butyl-4-methylphenol, 2,2'-methylene-bis(6-tert.butyl-4-methylphenol), 2,2'-methylene-bis(6-tert.butyl-4-ethylphenol), 2,2'-methylene-bis(4-methyl-6-α-methylcyclohexyl) phenol, 1,1,3-tris(5-tert.butyl-4-hydroxy-2-methylphenyl) butane, 4,4'-thiobis(6-tert.butyl-3-methylphenol), 3,5-di-tert.butyl-4-hydroxybenzyl-phosphonic acid diethylester, N,N'-di-(3,5-di-tert.butyl-4-hydroxyphenylpropionyl)-hexamethylenediamine, 1,2-bis(3,5-di-tert.butyl-4-hydroxyphenyl-propionyloxy)-ethane, 1,5-bis(3,5-di-tert.butyl-4-hydroxyphenyl-propionyloxy)-2-thiapentane, 1,3-bis(3,5-di-tert.butyl-4-hydroxyphenyl-propionyloxy)-2,2-dimethylpropane and 1,1-bis(5-tert.butyl-4-hydroxy-2-methylphenyl)-butane; the ratio of the phosphite to the antioxidant being from 10:1 to 1:5.

4,290,942

HEAT-STABILIZED CHLORINE-CONTAINING THERMOPLASTIC

Rainer Schneider, Bensheim-Auerbach, and Gerd Abeler, Grieshеim über Darmstadt, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 941,822, Sep. 11, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,858

Claims priority, application Switzerland, Sep. 30, 1977, 11983/77

Int. Cl.[3] C08K *5/37*

U.S. Cl. 260—45.85 H 1 Claim

1. A method for stabilizing chlorine-containing thermoplastics, which comprises incorporating into said thermoplastic a stabilizing amount of an epoxidised plasticizer, a phosphite, and a mercaptan of the formula (I)

$$R—(CH_2—SH)_n \quad (I)$$

wherein n is an integer from 2 to 4 and R represents a divalent to quadrivalent benzene or naphthalene, benzene or naphthalene substituted with alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 18 carbon atoms, or alkoxycarbonyl of 2 to 18 carbon atoms, or a divalent to quadrivalent group of the formula II

$$—Ar—X—Ar— \quad (II)$$

wherein Ar represents an phenyl group, unsubstituted or substituted with alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 18 carbon atoms, or alkoxycarbonyl of 12 to 18 carbon atoms, which carries the free valencies, and X represents a direct bond, alkylene, alkylidene or cycloaklylidene, O, S, SO or SO_2.

4,290,943

METHOD OF PREPARING POLYPEPTIDES

Christian Birr, Leimen, Fed. Rep. of Germany, assignor to Max-Plank-Gesellschaft, Gottingen, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,979

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830442

Int. Cl.[3] C07C *103/52;* C08L *37/00*

U.S. Cl. 260—112.5 R 4 Claims

1. Method for the preparation of a polypeptide comprising the steps of

(a) condensing a carrier material consisting of less than 0.5% cross-linked polystyrene gel and including bromacetyl phenyl groups whereby the gel is activated with a member selected from the group consisting of peptide fragments composed of at least 3 amino-acids, isoleucine, leucine, valine, protective group bearing cysteine and protective group bearing lysine, each member having an N-terminal of alpha-alpha-dimethyl-3,5-dimethoxy benzyloxycarbonyl to protect the N-terminal and provide a means for photometric following of the reaction;

(b) condensing the resulting carrier bound member with one or more amino-acids or peptide fragments to form a peptide moiety;

(c) splitting off the peptide moiety;

(d) separating the peptide from contaminating byproducts;

(e) introducing an N-terminal of alpha-alpha-dimethyl-3,5-dimethoxybenzyloxycarbonyl into the peptide moiety; and

(f) condensing the product of step (e) again with the carrier material of step (a) and repeating steps (b) to (f) until the peptide moiety, formed on the carrier material, is equivalent to the desired end product polypeptide, and thereafter splitting off the peptide moiety and isolating the desired end product polypeptide thus freed.

4,290,944

ANTIGENIC PEPTIDE COMPOUND

Erwin Goldberg, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Jul. 31, 1980, Ser. No. 174,011

Int. Cl.[3] C07C *103/52*

U.S. Cl. 260—112.5 R 1 Claim

1. The antigenic linear peptide compound having the formula: N-Met-Gln-Lys-Asp-Leu-Glu-Leu-C wherein N-Met is N-terminal L-methionine, Leu-C is C-terminal L-leucine, and Gln, Lys, Asp, Glu, and Leu are the L-amino acid forms, respectively, of glutamine, lysine, aspartic acid, glutamic acid, and leucine.

4,290,945

α,α-AZO-BIS-ISOBUTYRIC ACID α,ω-BIS ALKYL ESTER DERIVATIVES AND METHOD FOR PREPARING SAME

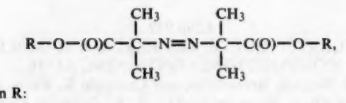
Anatoly A. Syrov, ulitsa 3 Internatsionala, 52, kv. 51; Sergei S. Ivanchev, ulitsa Nalichnaya, 36, korpus 3, kv. 97; Oleg N. Primachenko, Suzdalsky prospekt, 38, korpus 1, kv. 13; Valentina A. Demidova, Poljustrovsky prospekt, 7, kv. 16; Boris V. Polozov, prospekt Smirnova, 20, korpus 3, kv. 32; Vladimir I. Fionov, ulitsa Komsomola, 49, kv. 5, and Evgeny N. Barantsevich, ulitsa Ordzhonikidze, 59, kv. 55, all of Leningrad, U.S.S.R.

Filed Nov. 6, 1979, Ser. No. 91,774

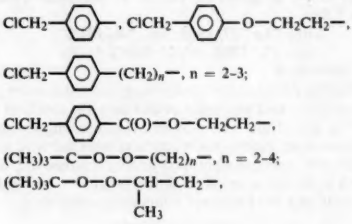
Int. Cl.[3] C07C *107/00*

U.S. Cl. 260—192 7 Claims

1. α,α'-Azo-bis-isobutyric acid α,ω-bis-alkyl ester derivatives of the formula:



wherein R:



4,290,946

PREPARATION OF HEXAMETHYLENEIMINE

Yasunobu Takahashi, Tokyo; Einosuke Fujimoto, Nobeoka; Toshio Shimizu, Nobeoka, and Takeo Kato, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1975, Ser. No. 598,914

Claims priority, application Japan, Jul. 25, 1974, 49-84665; Aug. 15, 1974, 49-92756; Oct. 8, 1974, 49-115181; Nov. 28, 1974, 49-135875; Mar. 13, 1975, 50-29461

Int. Cl.[3] C07D *295/02*

U.S. Cl. 260—239 B 12 Claims

1. A process for preparing hexamethyleneimine from hexamethylenediamine, which comprises the steps of continuously reacting hexamethylenediamine in the absence of hydrogen at about 80° to 150° C., 30 mmHg to 8 kg/cm^2 pressure in an inert solvent using a nickel catalyst and/or cobalt catalyst while maintaining the concentrations of hexamethyleneimine and hexamethylenediamine in the reaction mixture at 5% by weight or less and 10% by weight or less, respectively, by removing the hexamethyleneimine from the reaction system as soon as the hexamethyleneimine is formed.

4,290,947
PROCESS FOR THE PREPARATION OF THIENAMYCIN AND INTERMEDIATES

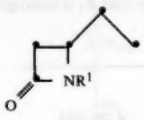
Burton G. Christensen, Scotch Plains; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzman, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 34,052, Apr. 27, 1979, abandoned. This application May 29, 1980, Ser. No. 154,190

Int. Cl.[3] C07D *205/08, 487/04*

U.S. Cl. 260—239 A 1 Claim

1. The compound:



I

wherein R^1 is a protecting group selected from t-butyl-dimethylsilyl, t-butyldiphenylsilyl, triphenylsilyl, isopropyldimethylsilyl, and 3,4-dimethoxybenzyl.

4,290,948
PROCESS FOR THEIR PREPARATION OF β-LACTAM ANTIBACTERIAL AGENTS

Edward G. Brain, Reigate, and Neal F. Osborne, Cranleigh, both of England, assignors to Beecham Group Limited, England

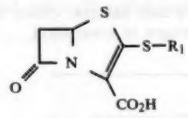
Filed Nov. 7, 1979, Ser. No. 91,978

Claims priority, application United Kingdom, Nov. 22, 1978, 45629/78

Int. Cl.[3] C07D *499/00*

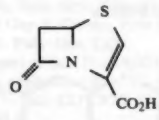
U.S. Cl. 260—245.2 R 8 Claims

1. A process for the preparation of the compounds of the formula (II):



(II)

and salts and esters thereof convertible by hydrogenolysis, hydrolysis or fluoride ion wherein R_1 is a hydrocarbon group of up to 12 carbon atoms and which optionally also has up to 4 heteroatoms selected from oxygen, nitrogen, sulphur or chlorine and bromine which process is carried out by the reaction of an ester of a compound of the formula (III):



(III)

with one equivalent of a strong base of low nucleophilicity and thereafter with a compound of the formula (IV) or (V):

$$R^2SO_2SR_1^1 \quad \text{(IV)}$$

$$Cl—S—R_1^1 \quad \text{(V)}$$

wherein R_1^1 is a group R_1 in which any amino substituent is protected and R^2 is an alkyl group of 1–4 carbon atoms optionally substituted by a phenyl group or is a phenyl group optionally substituted by an alkyl group of 1–4 carbon atoms and thereafter when desired converting the ester moiety to the acid form of the formula (II) or a salt thereof and removing the protecting group from any protected amino group present in R_1^1.

4,290,949
ESTERS OF 2-VINYLCLAV-2-EM-3-CARBOXYLIC ACID AND PROCESS FOR PREPARING SAME

Peter C. Cherry, South Harrow; Christopher E. Newall, Ealing; Nigel S. Watson, Greenford; Gordon I. Gregory, Chalfont St. Peter, and Peter Ward, Northolt, all of England, assignors to Glaxo Operations UK Limited, Greenford, England

Filed Jun. 24, 1977, Ser. No. 809,915

Claims priority, application United Kingdom, Jun. 25, 1976, 26595/76; Sep. 9, 1976, 37446/76

Int. Cl.[3] C07D *498/04*

U.S. Cl. 260—245.3 1 Claim

1. Crystalline 4-nitrobenzyl (5R)-2-vinylclav-2-em-3-carboxylate.

4,290,950
SULFO-SUBSTITUTED-3,6-DI(N-INDOLINYL)-9-SULFONAMIDOPHENYL-XANTHENES

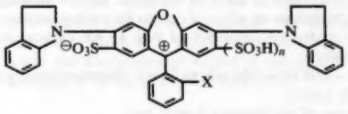
Richard L. Cournoyer, Waltham, and James W. Foley, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 106,938, Dec. 26, 1979. This application May 30, 1980, Ser. No. 154,618

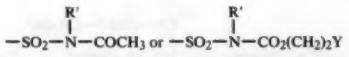
Int. Cl.[3] C07D *209/08*

U.S. Cl. 260—326.12 R 5 Claims

1. A compound of the formula



wherein X is



wherein R' is methyl; Y is an electron-withdrawing group having a positive sigma value greater than 0.60; and n is 0 or 1.

4,290,951
3,6-DI(N-INDOLINYL)-9-SULFONAMIDOPHENYL-XANTHENES

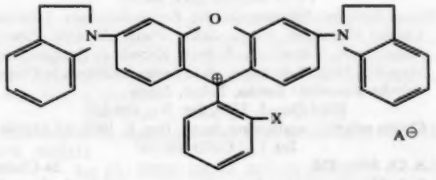
James W. Foley, Andover; Louis Locatell, Jr., Wellesley Hills, and Charles M. Zepp, Boylston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 106,905, Dec. 26, 1979. This application May 30, 1980, Ser. No. 154,619

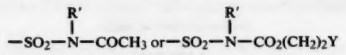
Int. Cl.[3] C07D *209/08*

U.S. Cl. 260—326.12 R 5 Claims

1. A compound of the formula



wherein X is



wherein R′ is methyl; Y is an electron-withdrawing group having a positive sigma value greater than 0.60; and A is an anion.

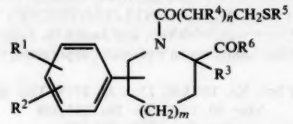
4,290,952

ARYL-1-MERCAPTOALKANOYLPROLINE AND HOMOPROLINE DERIVATIVES

Meier E. Freed, Paoli, and James L. Diebold, Norristown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,967
Int. Cl.³ C07D *207/16, 211/60*
U.S. Cl. 260—326.47 **8 Claims**

1. A compound of the formula:



wherein

R^1 and R^2, are independently, hydrogen, alkyl of one to six carbon atoms, alkoxy of one to six carbon atoms or halo;

R^3 is hydrogen or alkyl of one to six carbon atoms;

R^4 is hydrogen or alkyl of one to six carbon atoms;

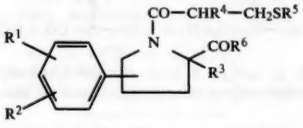
R^5 is hydrogen, alkanoyl of two to six carbon atoms or benzoyl;

R^6 is —OH or —OM where M is a pharmaceutically acceptable cation;

m is one of the integers 0 or 1; and

n is one of the integers 0, 1 or 2.

2. A compound of the formula:



wherein

R^1 and R^2 are, independently, hydrogen or alkoxy of one to three carbon atoms;

R^3 is hydrogen or methyl

R^4 is hydrogen or alkyl of one to three carbon atoms;

R^5 is hydrogen, acetyl or benzoyl; and

R^6 is —OH or —OM where M is a pharmaceutically acceptable cation.

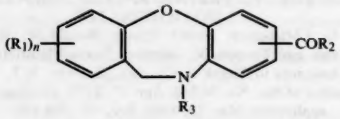
4,290,953

BENZOXAZEPINE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Masuo Koizumi, Mizumotoiizuka; Kazuo Sasahara, Ohmiya; Yasushi Murakami, Tokyo; Sakae Wada, Kashiwa; Hiroshi Nakakimura, Kamakura; Noboru Kubodera, Saitama, and Shun-Ichi Hata, Yokohama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1979, Ser. No. 100,437
Claims priority, application Japan, Dec. 6, 1978, 53-149934
Int. Cl.³ C07D *498/00*
U.S. Cl. 260—333 **24 Claims**

1. A dibenzoxazepine derivative represented by the formula



wherein R_1 is hydrogen, a halogen, a lower alkyl group or a lower alkoxyl group; n is an integer of 1 or 2; R_2 is a hydroxyl group, a lower alkoxyl group or a nuclear-substituted or unsubstituted anilino group; and R_3 is hydrogen or an carboxylic group.

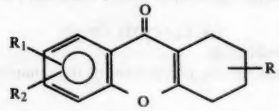
4,290,954

TETRAHYDROXANTHONE DERIVATIVES

Kazuhiro Onogi; Hisashi Kunieda; Kiyoshi Kawamura; Masami Shiratsuchi, all of Higashimurayama; Masahiko Nagakura, Sayama, all of Japan; Naoki Machida, deceased, late of Higashimurayama, Japan, and by Takayasu Miwa, heir, Nagoya, Japan, assignors to Kowa Company Limited, Nagoya, Japan

Filed Oct. 30, 1979, Ser. No. 89,403
Claims priority, application Japan, Nov. 1, 1978, 53-134958
Int. Cl.³ C07D *311/86, 413/10, 405/10*
U.S. Cl. 260—335 **9 Claims**

1. A tetrahydroxanthone compound of the formula:



wherein R_1 and R_2 are each halogen, cyano, lower alkyl or carboxyl and R is hydrogen or lower alkyl.

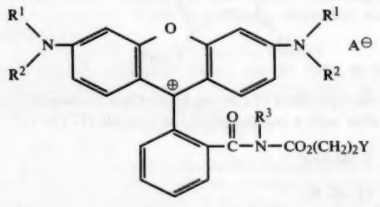
4,290,955

3,6-DI(ALKYL/PHENYL)AMINO-9-CARBOXAMIDOPHENYL-XANTHENES

Louis Cincotta, and James W. Foley, both of Andover, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 106,902, Dec. 26, 1979. This application May 30, 1980, Ser. No. 154,620
Int. Cl.³ C07D *311/82*
U.S. Cl. 260—336 **6 Claims**

1. A compound of the formula



wherein each R^1 the same or different is hydrogen or alkyl having 1 to 4 carbon atoms, each R^2 the same or different is alkyl or phenyl having 1 to 4 carbon atoms, R^3 is phenyl or alkyl having 1 to 4 carbon atoms, Y is an electron-withdrawing group having a positive sigma value greater than 0.6 as defined by Hammett's Equation, and A is an anion.

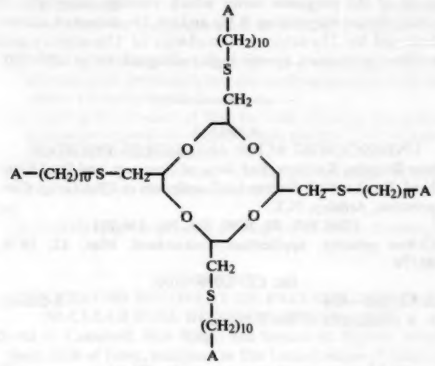
4,290,956

TENSIO-ACTIVE POLYPOD COMPOUNDS, PROCESS FOR PREPARING THEM AND COMPOSITIONS CONTAINING THEM

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 10, 1979, Ser. No. 56,204
Claims priority, application France, Jul. 13, 1978, 78 21081
Int. Cl.[3] C07D *323/00*
U.S. Cl. 260—338 28 Claims

1. Tensio-active cyclic polyethers of the general formula:



wherein A refers to a cationic, anionic, zwitterionic or non-ionic hydrophile block which includes one or more groupings, identical or different, selected from the group consisting of amine, ammonium, ammonio alkyl carboxylate, ammonio alkyl sulfonate, carboxylic amide, ether, thioether, hydroxyl, carboxylic ester and carboxylic acid groupings.

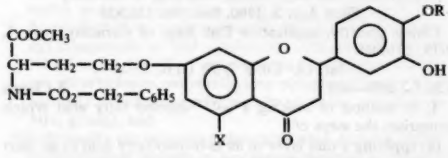
4,290,957

FLAVONONE PRECURSORS FOR ALPHA AMINO ACID DIHYDROCHALCONES

Grant E. Du Bois, Palo Alto; Rebecca A. G. Stephenson, Redwood City, and Guy A. Crosby, Palo Alto, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation-in-part of Ser. No. 19,054, Mar. 9, 1979, Pat. No. 4,226,804. This application Dec. 12, 1979, Ser. No. 102,699
Int. Cl.[3] C07D *311/32*
U.S. Cl. 260—345.2 3 Claims

1. The flavanone represented by the formula



wherein X is selected from between hydrogen and hydroxy and R is an alkyl of from 1 to 4 carbons.

4,290,958

SPIRO[CYCLOHEXANE-1,1'(3'H)-ISOBENZOFURAN]S

Lawrence L. Martin, Lebanon, N.J., and Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 73,055, Sep. 6, 1979, Pat. No. 4,263,317.
This application Nov. 28, 1980, Ser. No. 211,153
Int. Cl.[3] C07D *307/94*
U.S. Cl. 260—346.73 2 Claims

1. 4-Oximino-3'-phenylspiro[cyclohexane-1,1'(3'H)-isobenzofuran].

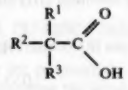
4,290,959

PREPARATION OF PROPYLENE OXIDE

Robert S. Barker, Bloomfield, N.J., assignor to Halcon Research and Development Corp., New York, N.Y.

Continuation of Ser. No. 941,603, Sep. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 806,980, Jun. 16, 1977. This application Jan. 7, 1980, Ser. No. 110,424
Int. Cl.[3] C07D *301/03*
U.S. Cl. 260—348.24 14 Claims

1. A process for preparing propylene oxide which comprises contacting propylene in a reaction zone with a thallic salt consisting essentially of a thallic alkanoate derived from an alkanoic acid containing from 1 to 20 carbon atoms, in the presence of an acidic aqueous reaction medium consisting essentially of water, said thallic alkanoate and at least one alkanoic monocarboxylic acid which possesses at least seven carbon atoms per molecule and which is selected from the group consisting of (a) acids of the formula (I):



(I)

wherein R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkaryl, aralkyl, and derivatives of the foregoing groups in which a non-carbonyl carbon is replaced by oxygen, and (b) halogenated derivatives of the above acids, with the proviso that when R^1 is aryl or alkaryl, R^2 and R^3 are not both hydrogen.

4,290,960

PREPARATION OF 2,5-DIMETHYL-4-HYDROXY-2,3-DIHYDROFURAN-3-ONE

Karl-Heinz Ross, Mutterstadt; Christian Dudeck, Limburgerhof; Walter Himmele, Walldorf; Rolf Lebkuecher, Ludwigshafen, and Wolfgang Sauer, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,467
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910131
Int. Cl.[3] C07D *303/14, 307/32, 307/20*
U.S. Cl. 260—348.57 1 Claim

1. 3,4-Epoxy-hexane-2,5-diol.

4,290,961
PROCESS FOR CATALYTICALLY REDUCING CARBONYL COMPOUNDS

Giovanni Mestroni; Grazia Zassinovich, and Annamaria Camus, all of Trieste, Italy, assignors to Montedison S.p.A., Milan, Italy

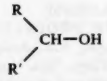
Filed Mar. 7, 1980, Ser. No. 128,049

Claims priority, application Italy, Mar. 7, 1979, 20822 A/79; Feb. 4, 1980, 19671 A/80

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.4 **22 Claims**

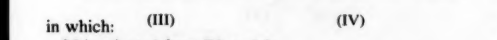
1. A process for catalytically reducing carbonyl compound by transfer of hydrogen from alcohols to aliphatic, alicyclic, aromatic homo- and heterocyclic ketones or aldehydes, catalyzed by complexes of rhodium or of iridium, comprising the reaction of a primary or secondary alcohol of formula (I) or a glycol:



(I)

with a ketonic compound of formula (II):

in which R and R′ and respectively R″ and R‴, also linked with each other according to homo- or heterocycles, are indifferently a hydrogen atom or a hydrocarbyl group having up to 30 atoms of carbon, provided that at least one of the symbols R″ and/or R‴ is different respectively from R and/or R′, in the presence of a complex catalyst of rhodium or of iridium selected from those having formulas (III) and (IV):



(III) (IV)

in which:

M is selected from Rh and Ir;

Chel is a chelating bidentate nitrogenous compound;

L-L is a molecule of a diolefin, or two molecules of a monoolefin;

X^- is an anion selected from Cl^-, Br^-, J^-, FF_6^-, BF_4^-, ClO_4^-, $B(C_6H_5)_4^-$;

Y is a halogen; and

n is an integer from 0 to 3;

and in the presence of a compound selected from among mineral alkalis, at a temperature ranging from about 20° C. to the boiling temperature of the reaction mass.

4,290,962
NOVEL HYDROCCRTISONE DERIVATIVE

Yasuhide Tachi, Tokyo; Kazuhiko Michishita, Omiya; Jozi Nakagami, Hasuda; Jiro Sawada, Tokyo; Mitsunori Washitake, Omiya, and Yoshiaki Kamano, Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1979, Ser. No. 24,111

Claims priority, application Japan, Mar. 29, 1978, 53-36251

Int. Cl.³ C07J *5/00*

U.S. Cl. 260—397.45 **1 Claim**

1. 17α-butyryloxy-11β-hydroxy-21-propionyloxy-4-pregnen-3,20-dione.

4,290,963
PROCESS FOR PREPARING $\Delta^{9(11)}$ AND/OR Δ^{16}-UNSATURATED STERNOIDS

Paul-Eberhard Schulze, and Ulrich Kerb, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,210

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2929558

Int. Cl.³ C07J *5/00*

U.S. Cl. 260—397.45 **10 Claims**

1. A process for preparing a $\Delta^{9(11)}$-and/or Δ^{16}-unsaturated steroid of the pregnane series which consists essentially of heating the corresponding 9,11- and/or 16- saturated steroid substituted by 17α-acyloxy, 16α-chloro or 17α-acyloxy and 9α-chloro, in an inert, aprotic high-boiling solvent at 180°–350° C.

4,290,964
UNDESCANOIC ACIDS AND ESTERS THEREOF

Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Paul Lienhard, Frenkendorf, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

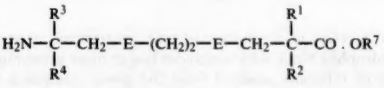
Filed Feb. 29, 1980, Ser. No. 126,081

Claims priority, application Switzerland, Mar. 12, 1979, 2330/79

Int. Cl.³ C09F *5/00*

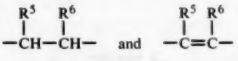
U.S. Cl. 260—404 **8 Claims**

1. A compound of the formula I



(I)

wherein each of R^1 and R^3 independently is hydrogen or a straight chain or branched alkyl radical of 1 to 8 carbon atoms, and R^3 is also a phenyl radical, R^2 is a straight chain or branched alkyl radical of 1 to 8 carbon atoms and R^4 is a straight chain or branched alkyl radical of 1 to 18 carbon atoms, or R^1 and R^2 R^3 and R^4 or both pairs together with the carbon atom to which they are individually attached each form a cycloaliphatic ring containing 4 to 8 carbon atoms, and wherein each E represents one of the radicals



and

in which each of R^5 and R^6 independently is hydrogen or alkyl of 1 to 4 carbon atoms and R^7 is hydrogen or a straight chain or branched alkyl radical containing altogether 1 to 18 carbon atoms.

4,290,965
METHOD OF MAKING I^{123} LABELED FATTY ACIDS

Gerhard Stöcklin, Jülich; Peter Laufer, Niederzier-Steinstrasse, and Jürgen Machulla, Essen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich, Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,928

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914089

Int. Cl.³ C09F *7/00*; C11C *3/00*

U.S. Cl. 260—408 **5 Claims**

1. A method of making a ω-I^{123}-labeled fatty acid which comprises the steps of:

(a) applying a thin layer of an ω-bromo-fatty acid to an inert support;

(b) contacting said layer on said support with an I^{123} containing iodide; and

(c) heating said layer on said support in contact with said I^{123} iodide to a temperature sufficient to effect halogen substitution whereby said ω-bromo-fatty acid is converted into the corresponding ω-I^{123}-fatty acid.

4,290,966

PROCESS FOR THE PREPARATION OF TRAUMATIN

Jeannette E. Brown, Summit; Edward F. Rogers, Middletown, and Donald W. Graham, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1980, Ser. No. 193,790
Int. Cl.³ C11C *1/00*
U.S. Cl. 260—413 **6 Claims**

1. A process for the preparation of traumatin which comprises:

(a) treating 10-oxomethyldecanoate in a non-polar organic solvent with (triphenylphosphoranylene)acetaldehyde to obtain 12-oxomethyldodecenoate;

(b) treating the product of Step (a) with ethylene glycol in a non-polar organic solvent to obtain methyl 11-(1,3-dioxalane-2-yl)-10-undecenoate;

(c) hydrolyzing the product of Step (b) to obtain 11-(1,3-dioxalane-2-yl)-10-undecenoic acid;

and

(d) hydrolyzing the product of Step (c) to obtain traumatin.

4,290,967

PROCESS FOR RECOVERY OF PALLADIUM FROM NUCLEAR FUEL REPROCESSING WASTES

David O. Campbell, Oak Ridge, and Samuel R. Buxton, Wartburg, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1980, Ser. No. 159,892
Int. Cl.³ C01G *55/00*; G21F *9/04*
U.S. Cl. 260—429 R **8 Claims**

1. A method for selective removal of palladium from a nitric acid solution of nuclear fuel reprocessing wastes, from which fuel values have been removed, comprising the steps of:

(a) adjusting the concentration of nitric acid in the solution to 8–12 M,

(b) adding to the resulting 8–12 M nitric acid solution a mono- or disaccharide in an amount sufficient to react with palladium contained in the solution,

(c) heating the resulting mixture contai[illegible]g mono- or disaccharide under reflux until precipitation of a palladium-containing solid ceases, and

(d) separating the palladium-containing solid from a supernatant liquid.

4,290,968

PREPARATION OF POLYISOCYANATES FROM POLYCARBAMATES

John J. Leonard, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 23, 1980, Ser. No. 171,522
Int. Cl.³ C07C *118/00*
U.S. Cl. 260—453 P **3 Claims**

1. In the process of producing polyisocyanates by

(a) condensing an alkyl-N-phenylcarbamate having 1 to 3 carbons in the alkyl moiety in the presence of an acid to produce condensate containing diphenylmethane dicarbamates and polymethylene polyphenyl carbamates with by-product N-benzyl compounds, rearranging said N-benzyl compounds in said condensate with acid catalyst to obtain a pyrolysis feed mixture containing diphenylmethane dicarbamates, polymethylene polyphenyl carbamates and 0.02 to 1.0 percent by weight of amine impurities as NH_2 groups, and

(b) thermally decomposing the carbamate moieties in the pyrolysis feed mixture to isocyanate moieties to produce polyisocyanates,

the improvement comprises increasing the percent isocyanate content of said polyisocyanates by prior to step (b) converting any amine salt by-products in said pyrolysis feed mixture to free amine by-products by contacting the mixture with a weakly basic tertiary amine anion exchange resin and removing any free amine by-products by contacting the feed mixture with a strongly acidic sulfonated polyaromatic ion exchange resin whereby the amine impurity in the pyrolysis feed mixture is reduced to less than 0.001 percent by weight as NH_2 groups.

4,290,969

PROCESS FOR THE CONTINUOUS PRODUCTION OF POLYISOCYANATE

Kazurou Komatsu; Sojiro Matsumoto; Takeshi Maniwa, and Nobuyuki Shinmura, all of Hyuga, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1980, Ser. No. 177,961
Int. Cl.³ C07C *119/042, 127/24*
U.S. Cl. 260—453 AB **13 Claims**

1. A process for the continuous production of a polyisocyanate by reacting an organic diisocyanate with an adduct-producing agent that reacts with an isocyanate group to form an intermediate product having a urea bond and a gas, the initial stage of the reaction being performed in one or two continuous complete mixing type reactors until the amount of gas generated is at least about 80% of the amount of gas to be generated during the entire reaction, and the subsequent stage of the reaction is performed in a plug flow type reactor.

4,290,970

PROCESS FOR THE MANUFACTURE OF AROMATIC DI- AND/OR POLYISOCYANATES

Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,814
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 2942503
Int. Cl.³ C07C *118/00, 125/07*
U.S. Cl. 260—453 P **14 Claims**

1. A process for the preparation of an aromatic di- and/or polyisocyanate comprising the steps of

A. preparing an aromatic di- and/or polyurethane by

1. reacting a primary aromatic di- and/or polyamine with an O-alkyl carbamate at temperatures greater than 100° C.;

2. separating ammonia and other by-products from the aromatic di- and/or polyurethane;

B. cleaving the aromatic di- and/or polyurethanes at temperatures from 175° C. to 600° C.; and

C. isolating the di- and/or aromatic polyisocyanate resulting from step B.

4,290,971

METHOD OF PREPARING 2-(PHENYLAMINO)-IMIDAZOLINES-(2)

Atanas G. Georgiev; Kino D. Andreev, and Kina V. Konstantinova, all of Sofia, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Continuation-in-part of Ser. No. 4,982, Jan. 19, 1979, abandoned, and a continuation-in-part of Ser. No. 4,984, Jan. 19, 1979, abandoned. This application Jan. 9, 1980, Ser. No. 110,608
Int. Cl.³ C07C *157/14*
U.S. Cl. 260—453.5 **2 Claims**

1. A compound selected from the group consisting of:

(a) N-(2,6-dichlorophenyl)-N'-acetyl-S-methyl-isothiourea;

(b) N-(2,6-dichlorophenyl)-N'-acetyl-S-ethylosothiourea;

(c) N-(2,6-dichlorophenyl)-N'-benzoyl-S-methylisothiourea;

(d) N-(2,6-dichlorophenyl)-N'-propionyl-S-methyl-isothiourea;

(e) N-(2,6-dichlorophenyl)-N'-acetyl-S-benzyl-isothiourea;

(f) N-(2,6-dichlorophenyl)-N'-acetyl-S-n-butylisothiourea;

(g) N-(2,5-dichlorophenyl)-N'-acetyl-S-methyl-isothiourea;
(h) N-(3-iodophenyl)-N'-acetyl-S-methyl-isothiourea;
(i) N-(o-fluorophenyl)-N'-benzoyl-S-ethylisothiourea;
(j) N-(o-nitrophenyl)-N'-acetyl-S-methyl-isothiourea; and
(k) N-(2,6-dichlorophenyl)-N'-acetyl-S-isobutylisothiourea.

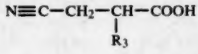
4,290,972

PROCESS FOR THE PRODUCTION OF 4-AMINOBUTYRIC ACID OR ITS DERIVATIVES

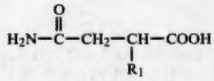
Toshio Yoneta, Yokohama; Seiji Shibahara, Tokyo; Shigeo Seki, Tokyo, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 805, Jan. 4, 1979, abandoned. This application Nov. 9, 1979, Ser. No. 92,940
Claims priority, application Japan, Jan. 25, 1978, 53-6142
Int. Cl.[3] C07C *99/10, 121/42, 121/453*
U.S. Cl. 260—465 B **10 Claims**

1. A process for preparing a nitrile compound of the formula



wherein R_3 is hydrogen, R_2COO— wherein R_2 is alkyl of 1–6 carbon atoms, or a protected amino group R_1, which comprises reacting a propionic acid compound of the formula



wherein R_1 is hydrogen, hydroxyl, or a protected amino group, with an alkanoic acid anhydride of the formula

$(R_2CO)_2O$

wherein R_2 has the above-indicated values in a liquid reaction medium consisting essentially of pyridine to form said nitrile compound.

4. A process according to claim 2, further comprising reducing the resultant nitrile product with hydrogen to form the corresponding 4-amino-2-hydroxybutyric acid derivative.

6. A process according to claim 5, further comprising reducing the resultant nitrile compound to form the corresponding 4-aminobutyric acid derivative.

10. A process according to claim 9, further comprising removing the amino-protecting groups to form the corresponding 2,4-diaminobutyric acid derivative.

4,290,973

PROCESS FOR MANUFACTURING PETROLEUM SULFONATES AND THE RESULTANT PRODUCTS

Robert Aude, Biviers; Pierre Baumgartner, Grenoble; Jean-Pierre Desmarquest, Mesnil Le Roi, and Jean-Pierre Franck, Bougival, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 17, 1980, Ser. No. 141,246
Claims priority, application France, Apr. 17, 1979, 79 09830
Int. Cl.[3] C07C *143/24*
U.S. Cl. 260—505 R **27 Claims**

1. A process for manufacturing petroleum sulfonates, which comprises the steps of:

(a) treating a hydrocarbon charge, having an aromatic hydrocarbon content of at least 20% by weight and an average molecular weight of at least 250, by contacting said charge with hydrogen in the presence of a carrier-supported NiW or NiMo hydrogenation catalyst having a Ni/W or Ni/Mo ratio, expressed as gram-atoms of the metals, of from 0.1:1 to 1:1, at a temperature of from 200° to 450° C., a total pressure of from 10 to 200 bars and an amount of hydrogen of at least 20 Nm^3 per m^3 of said hydrocarbon charge, said treatment with hydrogen being so effected as to decrease the sulfur content by at least 50% without decreasing the aromatic hydrocarbons content by more than 35%, the latter remaining at least 20% by weight after said treatment;

(b) reacting the hydrotreated effluent from step (a) with a sulfonating agent comprising SO_3; and

(c) neutralizing the sulfonation product with a base and recovering the resultant neutralized sulfonated product.

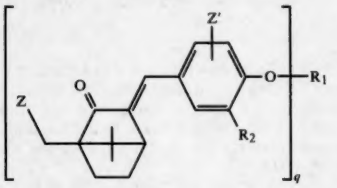
4,290,974

OXYBENZYLIDENE-BORNANONES, THEIR PREPARATION AND THEIR USE IN COSMETICS

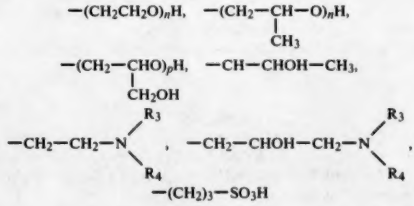
Claude Bouillon, Eaubonne, and Charles Vayssie, Villepinte, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 10, 1979, Ser. No. 56,262
Claims priority, application France, Jul. 11, 1978, 78 20701
Int. Cl.[3] C07C *143/36, 49/573, 49/563*
U.S. Cl. 260—511 **10 Claims**

1. Compound having the general formula:



in which: Z and Z' independently denote a hydrogen atom or a SO_3H radical or a salt thereof with an inorganic or organic base, at least one of Z and Z' denoting a hydrogen atom; R_1 denotes a hydrogen atom, an alkyl radical containing 2 to 18 carbon atoms when R_2 is other than an alkoxy radical, an alkyl radical containing 1 to 18 carbon atoms when R_2 is an alkoxy radical, an alkenyl radical containing 3 to 18 carbon atoms, a radical of formula



or a salt thereof with an organic or inorganic base, or $—(CH_2)_mCO_2R$, in which R denotes H or an alkyl radical containing 1 to 8 carbon atoms, or a divalent radical of formula $—(CH_2)_m—$ or $—CH_2—CHOH—CH_2$, m having a value from 1 to 10, n having a value from 1 to 20 and p having a value from 1 to 6, and R_3 and R_4 each independently denote a hydrogen atom or an optionally branched or hydroxy alkyl radical, or R_3 and R_4 together form a morpholino or a piperidino ring with the nitrogen atom to which they are attached; R_2 denotes a hydrogen atom, an alkoxy radical containing 1 to 4 carbon atoms or a divalent radical —O— bonded to the radical R_1 if the latter is also divalent; q denotes 1 or 2, such that if q is 2, R_1 is a said divalent radical, with the proviso that if R_1 denotes hydrogen R_2 also denotes hydrogen; when q is 1, at least one of Z, Z', R_1 and R_2 is not hydrogen and when Z and Z' are both hydrogen, R_1 is not $—CH_2—$ when R_2 is —O—.

4,290,975

N-SULFONYL AMINE-MEDIATED SULFAMATION OF AMINES

Grant E. DuBois, 4256 Ruthelma Ave., Palo Alto, Calif. 94306

Filed Apr. 14, 1980, Ser. No. 140,063
Int. Cl.[3] C07C *143/86*
U.S. Cl. 260—513.6 10 Claims

1. The process for sulfamation of primary organic amine which comprises the steps of:

(a) contacting said primary organic amine in liquid phase with catechol sulfate at a low to moderate temperature for a period of from about 1 hour to about 72 hours, thereby forming an O-2-hydroxyphenyl sulfamic acid ester, and

(b) hydrolyzing the O-2-hydroxyphenyl sulfamic acid ester by contacting it with a strong base at a temperature of from 50° C. to 200° C. for from 1 minute to 12 hours, thereby forming the sulfamic acid salt corresponding to said strong base.

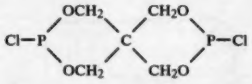
4,290,976

PROCESS FOR THE PREPARATION OF PHENOL-FREE PHOSPHITES

Ingenuin Hechenbleikner, West Cornwall, Conn.; James D. Klicker, Morgantown, W. Va., and William P. Enlow, Falls Village, Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation-in-part of Ser. No. 561,129, Mar. 24, 1975, abandoned. This application Jul. 22, 1976, Ser. No. 707,576
Int. Cl.[3] C07F *9/15*
U.S. Cl. 260—973 4 Claims

1. A process for preparing phenol-free dialkyl pentaerythritol diphosphite comprising reacting an alcohol having 10–20 carbon atoms with a pentaerythritol diphosphite having the structure



4,290,977

PROCESS FOR THE PRODUCTION OF NEUTRAL PHOSPHORIC ACID ESTERS

Uwe Hucks, Alpen; Claus Wulff, Krefeld; Erhard Tresper, Krefeld; Hugo Vernaleken, Krefeld, and Harald Selbeck, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,736
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833342
Int. Cl.[3] C07F *9/09*
U.S. Cl. 260—973 9 Claims

1. In the process for the production of neutral phosphoric acid esters comprising reacting a phosphorus halide selected from the group consisting of phosphorus oxyhalides, phosphorus pentahalides, phosphoric acid monoester dihalides and phosphoric acid diester halides with at least one phenolic compound in a two phase mixture of an organic solvent and an aqueous solution of a hydroxide of an alkali metal, alkaline earth metal or mixtures thereof, the improvement comprises using 1.01 to 4 moles of said phenolic compound and 1.01 to 2 moles of said hydroxide for each mole equivalent of phosphorus halide, the organic solvent being present in sufficient amount to form a 10 to 50% by weight solution of the product neutral phosphoric acid ester and upon completion of the reaction separating the organic solvent phase from the aqueous phase and isolating the neutral phosphoric ester by removing the organic solvent.

4,290,978

PRODUCTION OF PHOSPHORO CHLORIDE THIOLATES

Shigeo Kishino; Junichi Saito; Toyohiko Kume, and Kunihiro Isono, all of Tokyo, Japan, assignors to Nihon Tokushu Noyasu Seizo K.K., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,714
Claims priority, application Japan, Apr. 19, 1979, 54-47192
Int. Cl.[3] C07F *9/20*
U.S. Cl. 260—973 7 Claims

1. A process for the production of a phosphoro chloride thiolate of the formula

wherein

R^1 is alkyl, alkoxyalkyl, aryl, or aryl substituted by alkyl, alkoxy or halogen, and

R^2 is alkyl,

comprising reacting a mixture of a dialkyl chlorophosphite of the formula

$$(R^2O)_2PCl$$

and an alkyl dichloro phosphite of the formula

$$(R^2O)PCl_2$$

substantially free of trialkyl phosphite of the formula

$$(R^2O)_3P$$

with a substantially quantitative amount of a sulphenyl chloride of the formula

$$R^1SCl$$

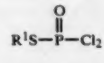
to produce a mixture of a phosphorochloridothiolate of the formula

and a phosphoro dichloride thiolate of the formula

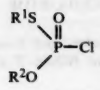
and reacting the mixture without isolation with an alcohol of the formula

$$R^2OH$$

in the presence of a dehydrochlorinating agent thereby to convert the phosphoro dichloride thiolate of the formula



to additional phosphorochloridothiolate

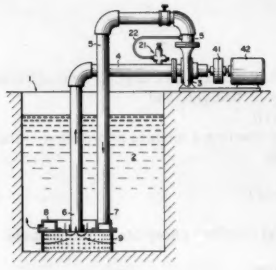


4,290,979

AERATION APPARATUS

Eiichi Sugiura, 149, Matsumotocho, Hekinan-shi, Aichi-ken, Japan

Filed Feb. 22, 1980, Ser. No. 123,761
Claims priority, application Japan, Feb. 24, 1979, 54-21054
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—4 5 Claims



1. An apparatus for supplying air to a liquid within a tank, comprising:

a pump connected to a drive source;

a suction pipe for feeding a liquid from the tank to the pump;

a discharge pipe for returning the liquid from the pump to the tank;

an air intake device disposed in the suction pipe and including a body having an air passage which provides a communication between the interior of the suction pipe and the atmosphere, a valve disposed in the air passage, and means including a conduit connecting the valve with the discharge pipe intermediate its ends for controlling the size of the air passage in accordance with the discharge pressure of the pump; and

an injector disposed within the tank and connected to the outlet end of the discharge pipe and including a housing which defines an annular passage, means for connecting the outlet end of the discharge pipe to the annular passage, and a plurality of injection ports spaced apart around the housing and communicating with the annular passage.

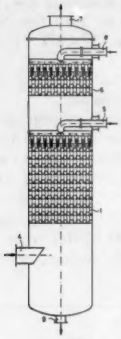
4,290,980

MASS EXCHANGER WITH PACKAGING

Jerzy Pikon, Gliwice, and Jan Hehlmann, Kodzierzyn-Kozle, both of Poland, assignors to Politechnika Slaska im. Wincentego Pstrowdkiego, Gliwice, Poland

Continuation of Ser. No. 954,213, Oct. 24, 1978, abandoned, which is a continuation of Ser. No. 797,863, May 17, 1977, abandoned. This application Apr. 8, 1980, Ser. No. 138,525
Claims priority, application Poland, Jun. 12, 1976, 190405
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—94 1 Claim

1. A mass exchanger apparatus with a packing, said apparatus being defined by a chamber, inlet means connected to said chamber for directing fluid into said chamber interior; packing disposed in said chamber for contacting said fluid to act thereon; means for further treating said fluid; outlet means to direct said finally treated fluid outside of said chamber; and including a cellular packing the form of a checkerwork matrix defining perpendicular cells open at a top part thereof and having a bottom part provided with skew bends, said cells having gaps so formed at the bottom part by the skew bends permitting accumulation of liquid in said cells, said gaps are



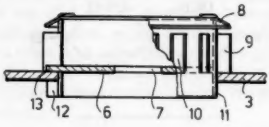
disposed to permit gas flow therethrough causing liquid in said cells to be foamed and excess liquid to be deflected by said bends and travel from said upper part to said bottom part.

4,290,981

EXCHANGER ELEMENT FOR BOTTOMS IN MATERIAL EXCHANGER COLUMNS

Arno Schramm, Moselstrasse 23, 6800 Mannheim, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,371
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848386
Int. Cl.[3] B01D *3/20*
U.S. Cl. 261—114 VT 1 Claim



1. An exchanger element for bottoms in material exchanger columns, comprising a cylinder fixed vertically in a bottoms opening, said cylinder having a vertical side wall provided with grid openings (10) for the passage of gas, said cylinder supporting a stationary cover plate (8) having a closed top for the deflection of the gas out through the grid openings and including an inner mobile valve plate (6) beneath the cover plate, said valve plate being equipped with one or more apertures allowing flow of gas therethrough, said grid openings being wholly above the bottoms to cooperate with the valve plate in regulating the volume of gas flow, said valve plate having guide straps (13) guidably mounted in selected of the grid openings, and said grid openings being defined by radially directed guide vanes (9).

4,290,982

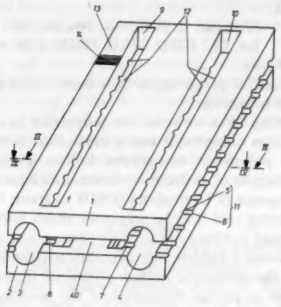
BUBBLER MAT WITH SEPARATE BOX TYPE MAT ELEMENTS

Ludwig Bauman, CH-9527, Niederhelfenschwil SG, Switzerland

Filed Jul. 9, 1979, Ser. No. 55,899
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829835
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—124 26 Claims

1. A bubbler mat having at least one box-like element connectable to an air supply, said mat element being formed of a pair of opposing part shells (1, 2, 21, 22, 31, 32) having surfaces

abuttable along a connection plane (40), said part shells having complementary grooves for forming at least one air-supply canal (3, 4) connectable to the air supply and lying along said connection plane when said shells are brought into abutment,



said abutting surfaces of said mat elements being so formed as to provide a plurality of air discharge openings (11, 12) lying along said connection plane, said air discharge openings being connected to said air supply canal and opening on the exterior of said part shells for producing streams of air on said exterior.

4,290,983

PIEZOELECTRIC AND PYROELECTRIC FILM AND METHOD FOR PREPARING THE FILM

Tohru Sasaki; Syuuzi Terasaki, and Tomoo Susa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1979, Ser. No. 95,379
Claims priority, application Japan, Nov. 21, 1978, 53-143735
Int. Cl.³ B29C *17/02*
U.S. Cl. 264—22 **8 Claims**

1. A method for preparing a piezoelectric and pyroelectric film comprising the steps of,

biaxially stretching a film made from a resin composition of a polymer of vinylidene fluoride;

additionally stretching the thus obtained biaxially stretched film at a temperature of lower than the crystallizing temperature of said resin composition, which additional stretching temperature is lower than the temperature at the biaxially stretching by more than 20° C. and is higher than the secondary transition temperature of said resin composition; and

at the same time or after the additional stretching polarizing the thus additionally stretched film

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4,290,984

METHOD FOR TREATING REFRACTORY BLOCK

LeRoy J. Gaffney, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Oct. 9, 1979, Ser. No. 82,918
Int. Cl.³ C04B *41/24*
U.S. Cl. 264—30 **25 Claims**

1. A method for improving the resistance to slag penetration of a refractory lining block for a furnace in which is conducted a process which produces slag, said method comprising the steps of:

forming a porous block of uncured refractory material consisting essentially of relatively coarse grains of a first refractory material in a matrix of relatively fine grains of a refractory material which is compatible with the refractory material in said coarse grains;

sintering said block to form a fully cured block, less porous than the unsintered block, but having some pores extending from the surface of said block inwardly along the matrix between coarse grains, said pores having cross-sectional spaces which are sufficiently large to permit penetration by said slag;

soaking said block in a first liquid which penetrates said pores and impregnates said block, said first liquid having a composition which reacts with refractory material in said block to form, in said matrix, a reaction product which is compatible with all the refractory material in said block and which, upon formation, reduces the size of the cross-sectional spaces in said pores to decrease the penetrability of said pores by said slag;

removing said block from said liquid and heating the block, while still impregnated with said first liquid, to promote said reaction to fuse together, by the heat of the reaction, discrete portions of said reaction product;

soaking said block, after said heating step, in a second liquid differing in composition from said first liquid and containing very fine particles of a refractory material which is compatible with the refractory material of which said block is composed and with said reaction product, to impregnate said block with said second liquid and deposit said very fine particles in said pores, to further decrease the penetrability of said pores by said slag;

said very fine particles penetrating said pores during said last recited soaking step; and

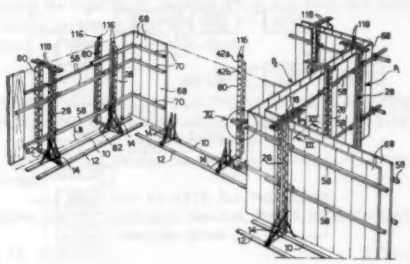
assembling said block into a refractory lining in said furnace.

4,290,985

SHUTTERING SYSTEM FOR CASTING CONCRETE WALLS OR PARTITIONS, AND A METHOD FOR ITS ASSEMBLY

Giuseppe Barale, Via Provinciale 3, Roccaforte Mondovi (Cuneo), Italy

Filed Jun. 10, 1980, Ser. No. 158,081
Claims priority, application Italy, Mar. 28, 1979, 67643 A79
Int. Cl.³ E04G *11/08*
U.S. Cl. 264—31 **10 Claims**



1. In a shuttering system for casting a concrete wall or partition comprising:

metal uprights arranged to face each other in two spaced-apart rows;

respective panels fastened to said uprights of each said row to form a pair of flat opposing surfaces which define a casting cavity for said concrete;

respective adjustable support means associated with each said upright in one row to maintain said uprights in their vertical positions of use and enable adjustment of the transverse perpendicularity of said uprights and the respective said surface supported thereby, and

respective upper and lower transverse connecting members which interconnect the upper and lower parts of respective said uprights facing each other across said cavity, said transverse connecting members enabling adjustment of the spacing between said upper and lower parts of said uprights, whereby the perpendicularity of said surface supported by said uprights in the other said row is adjustable to ensure said surfaces are parallel,

the improvements wherein:

a plurality of fixing means are spaced along each upright on it side which, in use, faces said casting cavity;

coupling elements are provided for fastening to said fixing means;

stringers are engageable with at least two said coupling elements fixed at substantially the same level in respective said fixing means on adjacent said uprights, in such a way that a flat side of said stringer faces said casting cavity and defines a vertical plane with said flat sides of neighbouring stringers, each said stringer at least partially comprising a soft material which forms an exposed face of said stringer;

fastening means are driven into and retained by said soft material of said stringers to fasten said panels to said flat side of said stringers, and

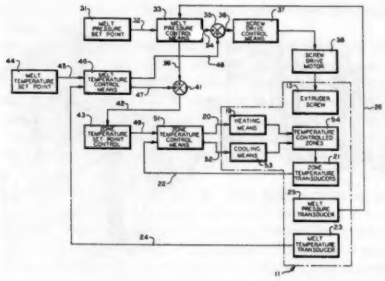
said panels are elongate with arbitrary widths, and are fastened to said stringers side-by-side.

4,290,986

METHOD FOR CONTROLLING A PLASTIC EXTRUDER

John E. Koschmann, Northwood, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 930,625, Aug. 3, 1978, Pat. No. 4,197,070.
This application Jun. 14, 1979, Ser. No. 48,576
Int. Cl.[3] B29C *3/02*
U.S. Cl. 264—40.3 **7 Claims**



1. A method for controlling the temperature at a predetermined point in an extruder apparatus having a barrel including a rotatable screw for moving extrusion material from an inlet to an outlet of the barrel and through a die attached to the barrel at the outlet comprising the steps of:

a. generating a temperature set point signal representing the desired temperature at said predetermined point;

b. generating a signal representing the actual temperature at said predetermined point in the extruder apparatus;

c. generating a first temperature control signal in response to said temperature set point signal;

d. generating an error signal representing the difference between said temperature set point signal and said actual temperature signal;

e. generating a second temperature control signal in response to said error signal and said first temperature control signal; and

f. controlling the temperature at said predetermined point in the extruder apparatus in response to said second temperature control signal.

4,290,987

PROCESS FOR PREPARING MICROPOROUS HOLLOW FIBERS

John W. Soehngen, Berkeley Heights, and John C. Chen, Westfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 54,050
Int. Cl.[3] B29D *27/00*; D01D *5/24*
U.S. Cl. 264—41 **5 Claims**

1. A process for preparing hollow open-celled microporous fibers which comprises:

(a) providing from at least one polyolefin having both an amorphous component and a crystalline component, solidified polymeric non-porous hollow precursor fibers with a degree of molecular orientation characterized by a birefringence of from about 0.0008 to about 0.005;

(b) contacting said hollow precursor fibers with a swelling agent, said swelling agent comprising a non-aqueous solvent having a Hildebrand solubility parameter at or near that of the polymeric hollow precursor fibers, for a time sufficient to permit absorption of the swelling agent into the hollow fibers;

(c) stretching said hollow precursor fibers while in contact with the swelling agent, which is maintained at a temperature greater than the glass transition temperature of the precursor fibers and the freezing point of the swelling agent and less than the temperature at which the precursor fibers dissolve, at a degree of stretch of from about 150 to about 400% based on the initial precursor fiber length and a strain rate of from about 5 to about 150%/min.; and

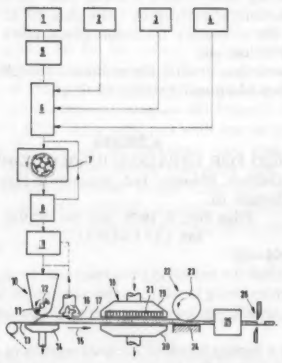
(d) removing the swelling agent from said hollow fibers while maintaining said hollow fibers in the stretched state.

4,290,988

METHOD FOR THE MANUFACTURE OF CELLULOSIC FIBROUS MATERIAL WHICH CAN BE PRESSED INTO MOULDED PARTS

Herbert Nopper, Kuppenheim, and Wolfgang Knoch, Gernsbach, both of Fed. Rep. of Germany, assignors to Casimir Kast GmbH & Co. KG, Gernsbach, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,763
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1978, 2845112
Int. Cl.[3] D04H *1/20*
U.S. Cl. 264—112 **22 Claims**



1. A method of manufacturing a dry shaped cellulosic fibrous transportable mat suitable for future compressing into a molded article, comprising:

(a) passing a dry celulosic fibrous waste material composed predominantly of paper, cardboard and/or textiles through a mill to pre-pulverize said material,

(b) mixing said pre-pulverized material with a dry thermo-

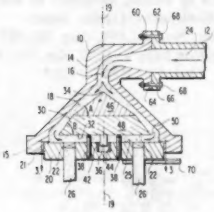
plastic bonding agent and a dry thermosetting bonding agent,
(c) grinding, and blending said mixture,
(d) feeding said mixture to a forming head, and depositing said mixture therefrom as a layer upon a moving endless conveyor having a suction chamber therebeneath,
(e) setting the thickness of said layer on the upper surface of said moving layer,
(f) passing said layer on said moving conveyor through a heater to plasticize the thermoplastic bonding agent while avoiding setting of the thermosetting bonding agent,
(g) passing said heated layer beneath a pressing roll to compact said layer to a transportable mat,
(h) cooling said compacted mat, and
(i) cutting said mat to desired lengths.

4,290,989

METHOD AND APPARATUS FOR EXTRUDING A PLURALITY OF RIBBONS

Michael G. Topor, Farmer's Branch; Peter A. Wicklund, and John T. Ivers, both of Lewisville, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 10, 1979, Ser. No. 101,701
Int. Cl.³ B29F *3/06*; A21C *11/16*
U.S. Cl. 264—142 **17 Claims**



10. An extruder head for substantially simultaneously forming extruded material into a plurality of ribbons comprising:
a housing having:
an inlet passage for directing the extrudant flow along an axis in a downward direction; and,
a flared extrudant flow section flared outwardly in the direction of extrudant flow and in fluid communication with and downstream of said inlet passage;
a plurality of constricted orifices positioned in a plane aligned generally perpendicular to said axis and in fluid communication with and downstream of said flared section for shaping said extrudant flow into a plurality of ribbons;
generally cone-shaped mandrel supported in said flow in said flared section of said housing having an upper portion directed into said extrudant flow and having a base of a sufficient diameter to overlie essentially all of said orifices thereby shaping the extrudant flow into a generally cone shaped shell configuration from the base of which said ribbons emanate through said orifices.

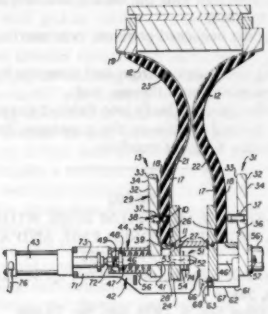
12. A method of substantially simultaneously forming a flow of dough extrudant into a plurality of vertically-extending extrudant ribbons having a substantially uniform flow rate of extrudant for each ribbon comprising the steps of:
directing a flow of extrudant under pressure in a downward direction along an axis;
forming said extrudant flow into an annular shell flaring outwardly from said axis in the direction of said flow;
turning said flow radially inward toward said axis thereby forming a generally cone-shaped extrudant flow envelope; and,
discharging said flow to a reduced pressure area essentially only through a plurality of orifices within the vertical projection of the base of said cone-shaped flow envelope.

4,290,990

METHOD OF FORMING THE MOUNTING PORTION OF A SIDEWALL PROTECTOR

Richard W. Kizer, Morton; Arlynn W. Anderson, Peoria, and Robert W. Untz, Hanna City, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 131,729, Dec. 17, 1979, Pat. No. 4,247,275.
This application Sep. 16, 1980, Ser. No. 187,693
Int. Cl.³ B29C *11/00, 23/00*
U.S. Cl. 264—156 **3 Claims**



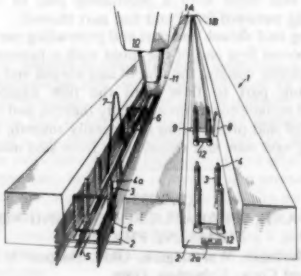
1. A method of forming a mounting portion of an annular article (**12**) made from uncured elastomer on a rigid mold (**19**) comprising the steps of:
moving a plate (**32**) having a plurality of punches (**37**) extending from one side (**33**) thereof toward the rigid mold;
piercing the annular article with the punches and forming a plurality of holes (**10**) in the annular article;
connecting the plate to the rigid mold with at least a portion of the annular article sandwiched therebetween;
placing the rigid mold, annular article and plate in a vulcanizing apparatus; and
curing the elastomer annular article.

4,290,991

METHOD OF MANUFACTURING CONCRETE SLEEPER BLOCKS AND A MATRIX ARRAY FOR CARRYING OUT THE METHOD

Stig Thim, Växjö, Sweden, assignor to A-Betong AB, Växjö, Sweden

Filed Nov. 19, 1979, Ser. No. 95,718
Claims priority, application Sweden, Dec. 5, 1978, 7812505
Int. Cl.³ B28B *23/06*
U.S. Cl. 264—157 **5 Claims**



1. A method of manufacturing concrete sleeper blocks for the construction of a railway switching point, comprising:
(a) providing a plurality of thin matrices having differing lengths corresponding to the desired lengths of differently

dimensioned sleeper blocks required for the construction of a given switching point,

(b) detachably mounting a variable plurality of upwardly extending attachment means to each matrix point at variable positions thereon as between different matrices in accordance with predetermined design specifications,

(c) placing the matrices in end to end abutment in an elongate mould bed,

(d) disposing and tensioning a plurality of reinforcing rods longitudinally within the mould bed,

(e) pouring concrete into the mould bed and allowing the concrete to cure,

(f) removing the hardened coherent concrete body from the mould,

(g) removing the matrices from said concrete body and the attachment means cast therein, and

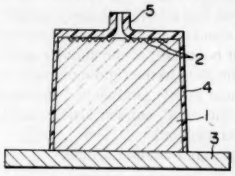
(h) cutting the concrete body into finished sleeper blocks of different desired lengths at the transverse lines of abutment between adjacent matrices.

4,290,992

HEAT-SHRINKABLE FILM TUBE WITH AN INTERNALLY RIBBED CLOSED END, AND A METHOD OF MAKING IT

Masaaki Fujio, Suita, Japan, assignor to Fuji Seal Industry Co., Ltd., Osaka, Japan

Filed Sep. 6, 1979, Ser. No. 73,068
Claims priority, application Japan, Sep. 28, 1978, 53-118615
Int. Cl.³ B29C *27/00*
U.S. Cl. 264—163 **7 Claims**



1. In a method for closing the end of a tube of heat shrinkable film which is placeable over a cylindrical mold, the improvement comprising the steps:

a—forming grooves in the surface of a first end of said cylindrical mold,

b—positioning said mold within said tube so that a portion of the tube extends beyond said first end,

c—heating and thereby causing said tube to shrink until an end part of the tube covers substantially entirely the first end of said mold with a protruding part of the tube extending outward from said end part thereof.

d—pressing said shrunk end part and protruding part against said grooved first end of the mold with a heated smooth plate, thereby causing the film of said shrunk end part and protruding part to flow until the film adjacent said grooved surface conforms generally thereto, and the outer surface of said pressed film is generally smooth, and

e—cooling said tube and removing it from said mold.

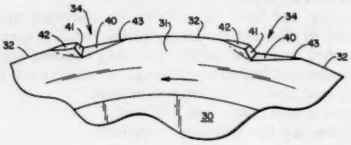
4,290,993

METHOD AND APPARATUS FOR MAKING NODULE FILAMENT FIBERS

Robert E. Maringer, Worthington, Ohio, assignor to Battelle Development Corp., Columbus, Ohio

Filed Jan. 10, 1980, Ser. No. 110,891
Int. Cl.³ B29C *5/04*
U.S. Cl. 264—164 **12 Claims**

1. In the method of producing filament fibers by rotating a heat extracting disk having an edge tapering to a narrow peripheral surface and having the peripheral surface indented at intervals, followed by introducing the rotating disk into the surface of a pool of molten material to form a film on the edge segments between indentations, and removing heat from the film while at least partially solidifying the film on the edge segments, the improvement comprising introducing a widened portion of the tapered edge segment at the leading surface of



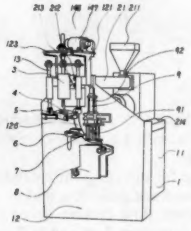
the indentations into the surface of the molten material followed by introducing a narrowed portion of the edge segment into the surface of the molten material, and then introducing a second widened portion of the tapered edge segment into the molten material as the edge is withdrawn from the molten material.

4,290,994

METHOD OF MOLDING HOLLOW BODIES

Kenkichi Murakami, Osaka, and Yoshiharu Kikuzawa, Takarazuka, both of Japan, assignors to Kabushiki Kaisha Plastic Kogaku Kenkyusho, Osaka, Japan

Continuation of Ser. No. 932,659, Aug. 10, 1978, abandoned.
This application May 6, 1980, Ser. No. 147,284
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—515 **8 Claims**



1. In a method of molding a hollow body by:

(a) continuously extruding downwardly into free space a melt of synthetic resin from a die thereby forming a moving tubular parison having a free end;

(b) closing and sealing the free end with a means for forming a bottom thereby forming a closed end on the parison;

(c) holding the parison with a means for holding;

(d) cutting the parison with a means for cutting thereby forming a cut-off tube with the closed end; and

(e) blowing a fluid into the cut-off tube retained in a mold thereby forming said hollow body;

the improvement wherein:

(1) steps b-d are performed in a successive order of (c) holding, (d) cutting, and (b) sealing;

(2) the die accommodates a mandrel extendable in the direction of extrusion to provide a mandrel extension having an end;

(3) the means for forming a bottom comprises a frame surrounding the path of movement of the parison, sealing members circumferentially spaced about the frame and radially movable, and means for moving said sealing members, and the step of closing and sealing comprises moving said sealing members from outside the parison toward its center, bringing said sealing members into contact with each other while filling the resin of the free end into a space provided between said end of said mandrel exten-

sion and said sealing members to form the closed end which is a bottom;

(4) the means for holding holds the portion of the moving parison which becomes the cut-off tube by its outside surface and is positioned at a distance away from the die in the direction of extrusion, the means for cutting is positioned between the die and the means for holding, and the means for forming a bottom is positioned between the means for cutting and the die; and

(5) the method further comprises during the steps of cutting and sealing, moving the means for forming a bottom, the means for cutting, the means for holding, and said mandrel extension at substantially the same speed and in substantially the same direction as the movement of the parison extruded from the die.

4,290,995

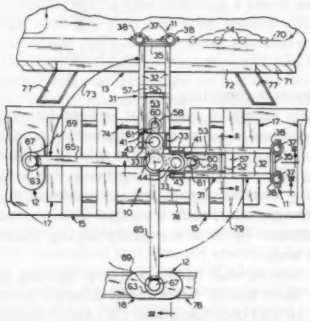
METHOD OF PRODUCING ARTICLES FROM THERMOPLASTIC PARISONS

David C. Oas, Lenox, Mass., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 38,893, May 14, 1979, Pat. No. 4,251,203. This application Jul. 25, 1980, Ser. No. 172,187

Int. Cl.³ B29C 17/07

U.S. Cl. 264—532 **11 Claims**



1. A method of producing articles from thermoplastic parisons, comprising:

cyclically oscillating about a vertical axis a mechanism having at least two adjacent but angularly spaced vertically reciprocable combination parison pickup and mold loading devices, and at least two vertically reciprocable molded article transfer devices angularly spaced from each other and from said loading devices;

presenting successive parisons at a pickup station located within reach of said pickup and loading devices;

providing a plurality of molding stations spaced from said pickup station and located within reach of said pickup and loading devices, and each of said molding stations having mold means adapted for receiving and molding the parisons into articles;

providing an article discharge station spaced from said molding stations and from said pickup station and located within reach of said transfer devices;

and operating said mechanism and said devices in a step-by-step cycle comprising, in the following order:

(1) orienting one of said loading devices in a parison pickup position above said pickup station and orienting a second of said loading devices above one of said molding stations, and in coordination therewith orienting one of said transfer devices above a second of said molding stations and orienting a second of said transfer devices above said discharge station;

(2) lowering said loading devices and transfer devices and thereby picking up a parison at said pickup station by means of said one loading device and loading a parison into said one molding station by means of said second loading device, and in coordination therewith entering said one transfer device into molded article stripping relation to said second molding station and discharging a molded article to said discharge station from said second transfer device;

(3) raising said loading and transfer devices above said stations;

(4) turning said mechanism in one direction of oscillation and orienting said one loading device over said second molding station, orienting said second loading device over said pickup station, orienting said one transfer device over said discharge station and orienting said second transfer device over said one molding station;

(5) lowering said loading devices and said transfer devices downwardly and loading a parison into said second molding station from said one loading device, picking up a parison at said pickup station with said second loading device, and in coordinated relation therewith discharging a molded article to said discharge station from said one transfer device and entering said second transfer device into article stripping relation to said one molding station;

(6) raising said loading devices and said transfer devices above said stations; and

(7) turning said mechanism in the opposite direction of oscillation and thereby returning said one loading device to said pickup station, returning said second loading device to said one molding station, returning said one transfer device to said second molding station and returning said second transfer device to said discharge station, for repeating the operating cycle.

4,290,996

METHOD FOR INITIATING BIAXIAL STRETCHING OF PLASTIC TUBES AND APPARATUS THEREFOR

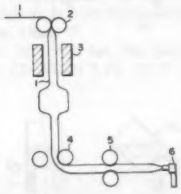
Kohtaro Hayashi, Chibaken; Ko Morihara, Chibashi, and Kohji Nakamura, Chibaken, all of Japan, assignors to Chisso Engineering Co.Ltd., Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 115,018

Claims priority, application Japan, Jan. 27, 1979, 54-8368

Int. Cl.³ B29D 7/24

U.S. Cl. 264—564 **7 Claims**



1. In the method of simultaneously stretching a plastic tube in the longitudinal and transverse directions by passing said plastic tube between at least one pair of delivery nip rolls and at least one pair of take-up nip rolls and making use of the pressure of a gas enclosed in said tube and the difference between the velocities of both the delivery and take-up nip rolls, the improvement in the step of enclosing a pressurized gas in said plastic tube between said delivery and take-up nip rolls, by extending the clearance of said at least one pair of take-up nip rolls and connecting an inlet for introducing a pressurized gas with said tube, on the downstream side of said take-up nip rolls which includes

passing said tube through between at least one pair of nipping means for enclosing a pressurized gas, which are provided on the upstream side and/or the downstream side of said take-up nip rolls in relation to film movement and driven at the same peripheral speed as that of said take-up nip rolls;

adjusting the clearance of said nipping means for enclosing a pressurized gas to from 1 mm to 10 mm when said pressurized gas is to be enclosed; and

taking up said tube while transmitting to said tube, a revolving power of said nipping means for enclosing a pressurized gas, by way of a frictional force between said tube and said nipping means created by the inside pressure of said tube.

4. In an apparatus for simultaneously stretching a plastic tube in the longitudinal and transverse directions by passing said plastic tube between at least one pair of delivery nip rolls and at least one pair of take-up nip rolls and making use of the pressure of a gas enclosed in said tube and the difference between the velocities of both said delivery and take-up nip rolls,

the improvement which comprises at least one pair of nipping means, which are provided on the upstream side and/or the downstream side of said take-up nip rolls in relation to film movement and driven at the same peripheral speed as that of said take-up rolls; the clearance between said at least one pair of nipping means being adjustable within the range of 1 mm or 10 mm; and which can cause a frictional force between these nipping means and said tube capable of taking up said tube through the inner pressure of said tube, when the clearance between said take-up nip rolls is extended and a pressurized gas is enclosed in said tube between said delivery nip rolls and said take-up nip rolls, to thereby initiate stretching of said tube.

4,290,997

APPARATUS FOR AUTOMATIC MEASUREMENT OF THE RESULTS OF AGGLUTINATION TESTS

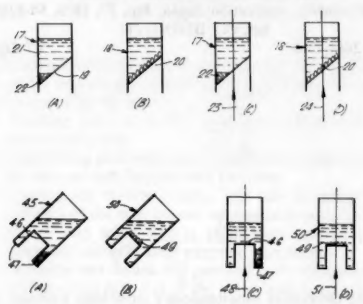
Osmo A. Suovaniemi, Helsinki, Finland, assignor to Kommandiittiyhtio Finnpipette Osmo A. Suovaniemi, Finland

Filed Feb. 26, 1979, Ser. No. 15,316

Claims priority, application Finland, Feb. 28, 1978, 780670

Int. Cl.³ G01N *1/00, 33/54, 35/00*

U.S. Cl. 422—73 **2 Claims**



1. An apparatus useful for the automatic measurement of the results of agglutination tests, said apparatus comprising at least one reaction vessel for the incubation of a sample to be tested prior to said testing, said reaction vessel having (a) at least one vertical side wall portion and a bottom portion, (b) at least one recess for receiving the non-agglutinated particles, said recess comprising an angle formed between said vertical side wall portion and said bottom portion, (c) an area for receiving the agglutinated particles such that said recess is out of the position of passage of a measurement beam which is adapted to measure the amount of agglutination which takes place within said reaction vessel, and (d) a measurement window for passage of said measurement beam, said apparatus being adapted for use in a vertical position.

4,290,998

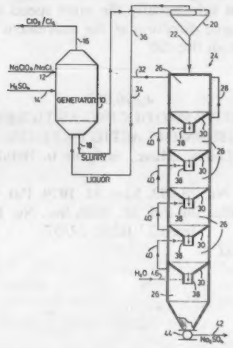
WASHING APPARATUS IN CHLORINE DIOXIDE PRODUCTION

Peter D. Dick, Brampton, and Gerald Cowley, Mississauga, both of Canada, assignors to Erco Industries Limited, Islington, Canada

Division of Ser. No. 971,790, Dec. 21, 1978. This application Dec. 17, 1979, Ser. No. 104,151

Int. Cl.³ B01J *8/12;* **B01D** *12/00, 43/00*

U.S. Cl. 422—193 **3 Claims**



1. An apparatus consisting of:

an elongate generally cylindrical upright tower having a cross-sectional dimension corresponding to a unit area value of about 0.07 to about 0.11 ft.²/ton solids/day,

a plurality of superimposed compartments within said tower extending from an upper-most compartment to a lower-most compartment, each separated from the next-lower compartment by a downwardly-sloping frusto-conical bottom wall,

each said bottom wall having a central opening and being joined to a short axially downwardly-directed unobstructed pipe having an inlet coinciding with the central opening in said bottom wall, said short pipe establishing a fluid relationship between adjacent superimposed compartments and having a cross-sectional dimension corresponding to a unit area value of about 0.005 to about 0.015 ft.²/ton solids/day,

slurry inlet means communicating with an upper region of the upper-most of said superimposed compartments for feeding thereto a slurry of solid materials to be treated in the apparatus,

slurry outlet means communicating with a lower region of the lower-most compartment for removing therefrom a slurry of solid materials treated in the apparatus,

treatment liquid inlet means communicating directly with the short pipe extending between the lower-most compartment and the next-higher compartment for feeding treatment liquid to said apparatus,

spent treatment liquid outlet means communicating directly with an upper region of the upper-most compartment for removing spent treatment liquid for said apparatus,

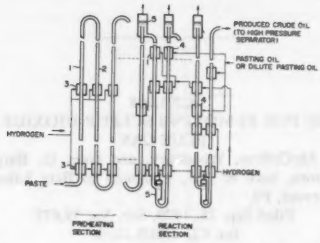
first liquid transfer means extending directly between an upper region of each said compartment in said column, with the exception of the two upper-most compartments, and said short pipe entering the next-higher compartment for transfer of liquid therethrough from one compartment to the next-higher compartment, and

second liquid transfer means extending directly between an upper region of the next-lower than said upper-most compartment and an upper region of said upper-most compartment for transfer of liquid therethrough to said upper-most compartment.

4,290,999
APPARATUS FOR DIRECT LIQUEFACTION

Minoru Morita; Shimio Sato; Takao Hashimoto, all of Yonezawa, and Yoji Kitaoka, Ichihara, all of Japan, assignors to The President of Yamagata University, Japan

Division of Ser. No. 9,828, Feb. 6, 1979. This application Nov. 1, 1979, Ser. No. 90,259
Claims priority, application Japan, Feb. 8, 1978, 53-12288
Int. Cl.[3] B01J *8/20, 10/00;* G10G *1/08*
U.S. Cl. 422—194 6 Claims



1. An apparatus adapted for direct liquefaction of coal, comprising a preheating section including a plural number of first pipe units, each first pipe unit being formed with a pressure resistant vertical gas-liquid ascendant pipe and a pressure resistant vertical gas-liquid descendant pipe and said first pipe units forming through respective pipe walls at several locations in both ascendant and descendant pipes thereof apertures for a hydrogen injection; a reaction section including a plural number of second pipe units, each second pipe unit being formed with a pressure resistant vertical gas-liquid ascendant pipe, a pressure resistant vertical gas-liquid descendant pipe and a high pressure gas/liquid separator disposed between said ascendant and descendant pipes, and said second pipe units forming through respective pipe walls at several locations in both ascendant and descendant pipes thereof apertures for a hydrogen injection and apertures for a paste of a low concentration or heavy oil injection, a high pressure separator, a first condensor for crude oils of low boiling points and a second condensor for crude oils of high boiling points, each of said first and second pipe units being formed in such a manner that a Reynolds number of 3×10^3 or greater and an axial dispersion coefficient (D/uL) of 0.05 or smaller are achieved for the fluid flows therein; and the pipe diameter ratio of a descendant pipe to an ascendant pipe is from 0.5 to 0.85.

4,291,000
PROCESS FOR THE PRODUCTION OF CHROMIUM TRIOXIDE

Danvers A. Swales, and Michael A. Marshall, both of Darlington, England, assignors to British Chrome & Chemicals Limited, Cleveland, England

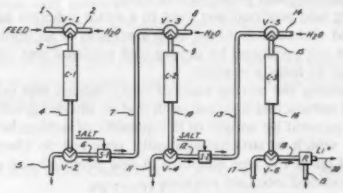
Filed Feb. 11, 1980, Ser. No. 120,432
Claims priority, application United Kingdom, Feb. 17, 1979, 05656/79
Int. Cl.[3] C01G *37/033*
U.S. Cl. 423—53 10 Claims

1. A process in which a purified product containing more than 95% chromium trioxide and less than 3% total sulphate, expressed as sodium bisulphate, is obtained from a crude crystalline product made by reacting concentrated aqueous sodium dichromate with sulphuric acid and separating the resultant crystalline crude product from the reaction liquor, the process comprising washing the crude crystalline product with a purifying wash liquor selected from the group consisting of water and an aqueous solution of chromic acid and in which part at least of the washing is conducted by spraying the wash liquor onto the crude product while the product and the liquor are at a temperature above 50° C. and below the fusion temperature while centrifuging and wherein centrifuging is continued until the water content is less than 3%.

4,291,001
RECOVERY OF LITHIUM FROM BRINE

Wendy J. Repsher, Lake Jackson, and Kirby T. Rapstein, Brazoria, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 26, 1979, Ser. No. 106,961
Int. Cl.[3] C01D *15/00*
U.S. Cl. 423—179.5 10 Claims



1. In a process for removing Li^+ values from a Li^+-containing aqueous solution by passing the solution through a resin/aluminate composite,

wherein said Li^+-containing aqueous solution is one which is not substantially loaded with non-competing metal salt, and

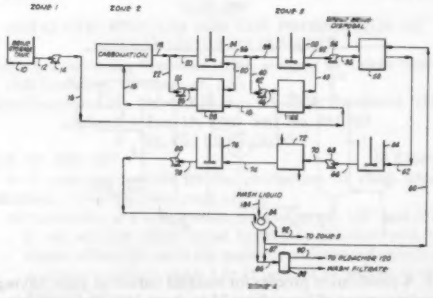
which composite comprises an anion exchange resin having crystalline $LiX.2Al(OH)_3$ dispersed therein, where x is halide, thereby substantially loading the said composite with Li^+ values, the improvement which comprises

loading the Li^+-containing solution with at least one non-competing metal salt prior to passing it through the resin/aluminate.

4,291,002
PROCESS FOR PRODUCING SODIUM CARBONATE FROM COMPLEX BRINES

Donald S. Arnold, Bethany, Okla.; James L. Fairchild; Donald A. Nichols, both of Trona, Calif., and Merlin D. Coe, Oklahoma City, OK, assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Oct. 25, 1977, Ser. No. 844,847
Int. Cl.[3] C01D *7/00, 7/37*
U.S. Cl. 423—189 12 Claims



1. A process for producing sodium carbonate comprising:

providing a brine containing sodium carbonate;

subjecting said brine to carbonation in carbonators to produce a hot carbonated brine slurry containing crystallized sodium bicarbonate;

maintaining the temperature level of said carbonated brine

slurry in said carbonators within a range of from about 125 degrees F. to about 165 degrees F.;

passing said hot carbonated brine slurry to a multistage crystallizer to precipitate additional crystallized sodium bicarbonate in the slurry;

filtering said slurry to produce at least one stream comprising a sodium bicarbonate filter cake or wet cake;

withdrawing said filter cake or wet cake and subjecting said filter cake or wet cake to pre-drying by heating in a pre-dryer to produce without substantial decomposition a predried wet cake possessing a free moisture content of from about 6 percent to about 12 percent by weight of solids;

withdrawing said predried wet cake;

passing said predried wet cake to a mixer wherein said predried wet cake is mixed with a portion of an unbleached light ash produced by drying said predried wet cake in a dryer to form a mixture;

maintaining the mixing ratio of said predried wet cake and said unbleached light ash such that an amount greater than 110 percent by weight of the quantity of unbleached light ash which is stoichiometrically required to chemically bind all of the free moisture in said predried wet cake is introduced into said mixture;

withdrawing the mixture from the mixer;

passing said mixture to said dryer wherein said mixture is dried without substantial sticking of the mixture to the heat transfer surfaces of the dryer to produce said unbleached light ash and a dryer off gas;

withdrawing a portion of said unbleached light ash from the dryer and mixing said portion of unbleached light ash with said predried wet cake in the mixer to form said mixture;

withdrawing another portion of said unbleached light ash from the dryer and subjecting said portion to bleaching in a bleacher to remove organic impurities to produce a bleached light ash;

subjecting said bleached light ash to recrystallization and drying to produce recrystallized sodium carbonate; and,

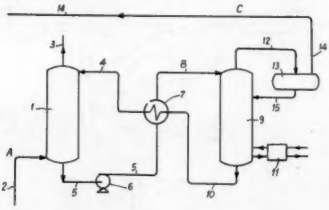
withdrawing and recovering said recrystallized sodium carbonate.

4,291,003

PROCESS FOR THE PURIFICATION OF RESIDUAL INDUSTRIAL GASES CONTAINING SMALL QUANTITIES OF SULFUR COMPOUNDS

Jacques Batteux, Serres Morlaas; Claude Blanc, and Pierre Grancher, both of Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed May 15, 1979, Ser. No. 39,384
Claims priority, application France, May 16, 1978, 78 14427
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—228 **4 Claims**



1. A purification process for residual industrial gases having a water content of from about 24 to about 34% and containing small quantities of H_2S, SO_2, CS_2, COS or sulfur vapor, as well as large quantities of CO_2 and N_2, comprising subjecting the residual gases to a catalytic reduction to transform the sulfur containing compounds in said residual gases into H_2S, washing the residual gases with an aqueous amine solution to form a H_2S enriched aqueous amine solution and effluent gases and discharging the burnt effluent gases to the atmosphere, regenerating the H_2S enriched aqueous amine solution by heating to produce gases comprising H_2S and CO_2 and regenerated aqueous amine solution, and, returning said gases comprising H_2S and CO_2 to a sulfur manufacturing unit; characterized in that the temperature of the gases in the process are permanently maintained at a level higher than the dew point of the water contained in the gases at each point in the process such that the H_2O contained in the residual gases is discharged into the atmosphere with said burnt effluent gases.

4,291,004

PROCESS FOR REMOVING SULFUR DIOXIDE FROM FLUE GAS

Craig R. McCaffrey, Woodbury, and Gary O. Barraclough, Vincentown, both of N.J., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 28, 1979, Ser. No. 79,672
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—242 **21 Claims**

1. A flue gas desulfurization process comprising in sequence:

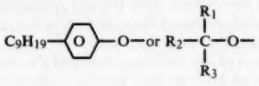
(1) contacting sulfur dioxide-containing flue gas with scrubbing liquor to remove sulfur dioxide therefrom and produce scrubber sludge,

(2) subjecting said scrubber sludge to primary dewatering,

(3) adding to said scrubber sludge an effective amount as a dewatering aid of polyethylene oxide compound having the formula

$$R—CH_2CH_2—O—_XH,$$

where X is about 2–40 and R is OH, sorbitan monooleate—O—, soya amine,



where R_1, R_2 and R_3 are selected from the group consisting of hydrogen and alkyl such that the sum of the total number of carbon atoms in R_1, R_2 and R_3 is an average of from about 8 to 20, and

(4) subjecting said scrubber sludge to secondary dewatering.

4,291,005

SETTLING OUT SUSPENDED SOLIDS IN PHOSPHORIC ACID PRODUCT SOLUTIONS

Andrew C. Poulos, and Michael J. Thibodeau, both of Lakeland, Fla., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 23, 1979, Ser. No. 32,594
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—321 R **4 Claims**

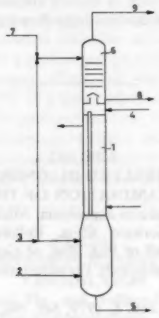
1. In the process for manufacture of phosphoric acid by dissolving phosphate rock in aqueous sulfuric acid solution and separating solids comprising insoluble sulfates from said solution by means comprising flocculation of suspended solids with an organic polymeric flocculating agent, the improvement wherein said flocculating agent is a copolymer consisting essentially of a predominant proportion of polymeric acrylic acid or acrylate units and a minor porportion of acrylamide units.

4,291,006

COMBINED PROCESS FOR THE PRODUCTION OF UREA AND AMMONIA

Giorgio Pagani; Vincenzo Lagana, both of Milan, and Francesco Saviano, Segrate, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 880,139, Feb. 22, 1978, abandoned. This application Jul. 20, 1979, Ser. No. 59,217
Int. Cl.[3] C01C *1/04*
U.S. Cl. 423—359 7 Claims



1. In a method for the concurrent production of ammonia and urea comprising the steps of producing ammonia in an ammonia-synthesis apparatus, absorbing ammonia at the exit of the ammonia-synthesis reactor with water, thus obtaining a concentrated aqueous solution of ammonia, utilizing the concentrated solution of ammonia for the absorption of the CO_2 contained in the raw gases for the synthesis of ammonia, obtaining ammonium carbamate, converting the ammonium carbamate partially into urea in a urea-synthesis reactor, thermally decomposing the carbamate which has not been converted into urea and stripping the decomposition products with a gas selected from the group consisting of ammonia, CO_2 and inerts, discharging from the stripping zone a solution of urea which still contains carbamate, recycling the products of decomposition of the carbamate to the urea-synthesis reactor, distilling under a pressure of from 3 to 30 atm, in at least one stage, the solution of urea to obtain liquid ammonia and one or more ammoniacal solutions of ammonium carbonate, and an aqueous solution of urea deprived of ammonium carbamate the improvement which comprises introducing the CO_2-containing gas at the bottom, or near the bottom, of an absorber which is split into two sections, the lower section being a film-absorber and the upper section being a plate-absorber, the absorbing solution in the upper section being the concentrated aqueous solution of ammonia aforesaid, the absorbing solution in the lower section being one or more of the aqueous ammoniacal solutions of ammonium carbonate as obtained by distillation of the solution of urea under a pressure of from 3 to 30 atm. with addition of liquid ammonia.

4,291,007

PROCESS FOR THE SEPARATION OF A STRONG MINERAL ACID FROM AN AQUEOUS SOLUTION

Avraham M. Baniel, Jerusalem, Israel, assignor to Yissum Research & Development Co. of Hebrew Univ. of Jeru., Jerusalem, Israel

Filed Mar. 28, 1980, Ser. No. 134,918
Claims priority, application Israel, Apr. 9, 1979, 57024
Int. Cl.[3] B01D *11/09*
U.S. Cl. 423—390 17 Claims

1. A process for the separation of a strong mineral acid from other species present in an aqueous solution and the recovery thereof under reversible conditions which obviate the consumption of chemicals for regeneration comprising the steps of:

(a) bringing an aqueous solution containing said mineral acid to be separated into contact with a substantially immiscible extractant phase, said extractant phase comprising:

(1) a strong organic acid which acid is oil soluble and substantially water immiscible both in free and in salt form;

(2) an oil soluble amine which amine is substantially water insoluble both in free and in salt form; and

(3) a carrier solvent for said organic acid and said amine, wherein the molar ratio of said organic acid to said amine is between about 0.5:2 and 2:0.5,

whereupon said predetermined mineral acid selectively and reversibly transfers to said extractant phase;

(b) separating said two phases; and

(c) backwashing said extractant phase with an aqueous system to recover substantially all the mineral acid contained in said extractant phase.

4,291,008

PROCESS FOR CALCINING AND DESULFURIZING PETROLEUM COKE

Harry L. Hsu, Johnson City; Edward E. Hardin, and Lloyd I. Grindstaff, both of Elizabethton, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,806
Int. Cl.[3] C01B *31/02*
U.S. Cl. 423—461 3 Claims

1. A process for producing calcined petroleum coke having a sulfur content in the range of about 1.8 to about 2.5 wt. % and a vibrated bulk density of at least about 78 g/100 cc from raw petroleum coke having a sulfur content of at least about 3.5 wt. % an a volatile content of at least about 7 wt. % which comprises:

(a) heating the coke at a temperature in the range of about 600° C. to about 800° C. in the absence of added hydrogen for a time sufficient to reduce the volatile content of the coke to a value in a range of about 3 to about 6 wt. %;

(b) heating the partially devolatilized coke at a temperature in the range of about 600° C. to about 800° C. in an atmosphere containing added hydrogen for a period of time sufficient to reduce the sulfur content of said coke to a level in the range of about 2.8 to about 3.3 wt. %; and

(c) heating the partially desulfurized coke at a temperature in the range of about 1350° C. to about 1600° C. in the absence of added hydrogen for a period of time sufficient to reduce the sulfur content of the coke to within the range of about 1.8 to about 2.5. wt. %.

4,291,009

CATALYTIC PROCESS FOR THE PRODUCTION OF ALKALI METAL STANNATES

John A. Franks, Jr., Vermilion, Ohio, assignor to Vulcan Materials Company, Birmingham, Ala.

Continuation of Ser. No. 48,828, Jun. 15, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 161,507
Int. Cl.[3] C01G *19/00*
U.S. Cl. 423—593 12 Claims

1. A catalytic process for the production of alkali metal stannates, comprising the steps of:

(a) contacting at a temperature between about 150° and 235° F. an aqueous alkali metal hydroxide solution with an excess of metallic tin in the presence of activated carbon in an amount of from about 1 to 15 percent by weight of said metallic tin;

(b) passing a molecular oxygen supplying agent selected from the group consisting of oxygen and air through said solution in the presence of said metallic tin and said activated carbon at a rate sufficient to promote the conversion of said metallic tin to alkali metal stannate and to form an alkali metal stannate solution, said rate being sufficient to

provide from about 0.02 to 0.4 liters of oxygen per minute per liter of solution; and

(c) recovering the resulting alkali metal stannate solution.

4,291,010

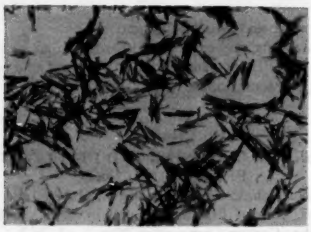
HEAT STABLE YELLOW IRON OXIDES

Jihei Senda; Yoshihiro Inoue; Toshiaki Uenishi; Hidefumi Harada; Kouji Nakata, and Akio Akagi, all of Ube, Japan, assignors to Titan Kogyo Kabushiki Kaisha, Ube, Japan

Filed Sep. 5, 1979, Ser. No. 72,805

Int. Cl.³ C01F *7/30;* C01G *49/02*

U.S. Cl. 423—594 **7 Claims**



4. A method of preparing FeAl(OOH), comprising the steps of:

(a) forming an aqueous slurry of ferric sulfate and an alkali metal hydroxide,

(b) curing the slurry, until α-FeOOH seeds are formed,

(c) adding sodium aluminate to the cured slurry,

(d) subjecting the resultant slurry to hydrothermal treatment, and

(e) separating the treated slurry into a solid phase and a liquid phase, with the solid phase consisting essentially of solid solution (FeAl)OOH.

7. The solid solution of the compound (FeAl)OOH.

4,291,011

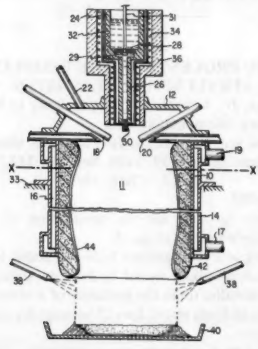
METHOD FOR PRODUCTION OF ALUMINUM OXIDE

Griffiths, Kenneth F., 31 London Ter., New Rochelle, N.Y. 10804

Continuation of Ser. No. 963,338, Nov. 24, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 187,435

Int. Cl.³ C01F *7/42*

U.S. Cl. 423—625 **27 Claims**



1. A method of producing aluminum oxide which comprises:

(a) introducing aluminum at a controlled rate into a reaction chamber at least partially bounded by a downwardly extending side wall of solid aluminum oxide,

(b) introducing oxygen into said chamber at a controlled rate sufficient to maintain in at least part of said chamber an atmosphere with a stoichiometric excess of oxygen with respect to oxidizable matter there,

(c) supplying heat to said chamber sufficient to initiate a flame-type reaction therein between said aluminum and oxygen wherein aluminum is converted to aluminum oxide,

(d) cooling at least a portion of the exterior surface of said wall to collect aluminum oxide formed in said flame-type reaction upon the inner surface of said wall as a downwardly flowing film of molten aluminum oxide, and

(e) recovering said downwardly flowing aluminum oxide.

4,291,012

TECHNETIUM-LABELLED DIAGNOSTIC AGENT FOR THE EXAMINATION OF THE RES

Helmut Strecker, Seeheim-Jugenheim; Michael Molter, Frankfurt am Main; Gerhard Kloss, Kelkheim, and Eberhard Schickel, Selters, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 4, 1979, Ser. No. 908

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800538

Int. Cl.³ A61K *49/00, 43/00;* G01T *1/00*

U.S. Cl. 424—1 **7 Claims**

1. A process for the preparation of a diagnostic agent for scanning the RES, which comprises mixing the sodium salt of 1-phenyl-2,3-dimethyl-pyrazolone-4-methylamino-methylsulfonic acid or 1-phenyl-2,3-dimethyl-pyrazolone in an aqueous solution with tin(II) salt in a molar ratio of 15:1 to 110:1, adjusting the resulting solution to a pH between 4 and 9, and afterwards adding from 0.1 to 100 mCi of ^{99m}Tc-pertechnetate in 1 to 10 ml of physiological saline solution.

4,291,013

MEDICINALLY USEFUL, SHAPED MASS OF COLLAGEN RESORBABLE IN THE BODY

Helmut Wahlig, Darmstadt; Elvira Dingeldein, Dreieich, and Dietrich Braun, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,520

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2843963

Int. Cl.³ A61K *9/22, 9/26;* A61F *13/00;* A61L *15/03*

U.S. Cl. 424—16 **7 Claims**

1. A collagen based drug delivery system which is resorbable in the body, is sterilized and has been compacted into the shape of a tablet, spheroid, foil, pipe, plate, fiber, granule, strand or tube implantable into the body, by the application of heat of a temperature of 130°–200° C., optionally also with application of pressure of 300–1200 bar, with extrusion, with injection molding or with sintering and which, upon administration to the body, essentially maintains its shape and effects a retarded liberation of the drug, comprising 0.2–20 weight percent of a pharmacologically active drug material, 1–25 weight percent of a bioresorbable binding agent for collagen, and the balance being finely ground collagen, the binding agent consisting essentially of a co- or homopolymer of lactide or glycolide or a co- or a homopolymer of a C_{2-16} α-hydroxyalkanoic acid.

4,291,014

POLYMERIC DIFFUSION MATRIX CONTAINING ESTRADIOL DIACETATE

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 167,729

Int. Cl.[3] A61L *15/03;* A61K *31/79*

U.S. Cl. 424—28 16 Claims

1. A self-supporting polymeric diffusion matrix for the sustained release of estradiol diacetate in order to deliver said estradiol diacetate to a patient and provide said patient with a uterine wall maintenance effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to about 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of estradiol diacetate to provide a sustained release of said estradiol diacetate over a prolonged period.

4,291,015

POLYMERIC DIFFUSION MATRIX CONTAINING A VASODILATOR

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jun. 26, 1980, Ser. No. 163,262

Claims priority, application Japan, Aug. 14, 1979, 54/103459

Int. Cl.[3] A61L *15/03;* A61K *31/21, 31/79*

U.S. Cl. 424—28 25 Claims

1. A self-supporting polymeric diffusion matrix suitable for the transdermal delivery of a vasodilator comprising from about 2 to about 60% of the polar plasticizer selected from the group consisting of glycerol, propylene glycol, and a polyalkylene glycol, from about 2 to about 15% of a matrix component selected from the group consisting of polyvinylalcohol, a polymer of hydroxyethylacrylate, a polymer of hydroxyethylmethacrylate, a polymer of hydroxypropylacrylate, and a polymer of hydroxypropylmethacrylate, from about 2 to about 10% of a water-soluble polymer with hydration sites which in combination with the remaining ingredients yields a matrix capable of sustained release of a vasodilator dispersed therein, at least one vasodilator suitable for transdermal delivery to a patient, and the balance water, the percentages being by weight.

4,291,016

ENTERIC COATED MIXTURE OF 4-(2-HYDROXY-3-ISOPROPYLAMINO-PROPOXY) INDOLE AND SODIUM LAURYL SULPHATE

Jean-Pierre Nougaret, St. Louis, France, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 36,690, May 7, 1979, abandoned, which is a continuation of Ser. No. 950,155, Oct. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,824, May 30, 1978, abandoned, which is a continuation of Ser. No. 818,092, Jul. 22, 1977, abandoned. This application Dec. 26, 1979, Ser. No. 107,167

Claims priority, application Switzerland, Jul. 27, 1976, 9588/76; Oct. 14, 1977, 12585/77

Int. Cl.[3] A61K *9/36, 9/62, 31/405*

U.S. Cl. 424—35 10 Claims

1. A pharmaceutical composition having a medicament matrix core comprising a mixture of 4-(2-hydroxy-3-isopropylaminopropoxy)indole, and sodium lauryl sulphate, and a physiologically acceptable film which is resistant to gastric juices and breaks down at pH of 5 or more coating the mixture.

4,291,017

METHOD FOR LIMITING ADHERENCE OF PLAQUE AND DENTAL COMPOSITION THEREFOR

John W. Beierle, San Marino, and Dale E. Grenoble, Malibu, both of Calif., assignors to Dental Concepts, Inc., Santa Monica, Calif.

Filed Nov. 19, 1979, Ser. No. 95,699

Int. Cl.[3] A61K *7/18*

U.S. Cl. 424—52 11 Claims

1. A method for reducing the adherence to teeth of plaque, comprising applying to a person's teeth a dentrifice containing 0.001–0.05% by weight titanium tetrafluoride and either at least 0.05% by weight of xylitol or at least 0.01% by weight of saccharin.

4,291,018

LIPSTICK OF THE CORE-SHEATH TYPE

Ichiro Oeda, and Isao Sano, both of Odawara, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,372

Claims priority, application Japan, Feb. 23, 1978, 53-20150

Int. Cl.[3] A61K *7/025, 7/027*

U.S. Cl. 424—64 9 Claims

1. In a lipstick of the core-sheath type comprising two different compositions A and B arranged in core-sheath relationship along the longitudinal axis thereof, the improvement wherein said composition A consists essentially of a homogeneous mixture of

(i) from 55 to 75% by weight of a low-viscosity oily ingredient having a viscosity of less than approximately 80 centipoises at 36° C.;

(ii) from 8 to 28% by weight of a viscous oily ingredient having a viscosity of at least approximately 200 centipoises at 36° C.; and

(iii) from 17 to 30% by weight of a waxy ingredient which is solid at 36° C.;

and wherein said composition B consists essentially of a homogeneous mixture of

(iv) from 50 to 75% by weight of (ii);

(v) from 15 to 30% by weight of (iii); and

(vi) from 5 to 20% by weight of (i);

said compositions A and B comprising from 77 to 100% by weight of the respective homogeneous mixture and having melting points of from 60° to 75° C. and the temperature difference therebetween being from 0° to 5° C.;

the weight of the composition of the core with respect to that of the sheath being in a weight ratio ranging from 1:2 to 2:1.

4,291,019

VACCINE FOR INFECTIOUS BOVINE RHINOTRACHEITIS

Harold W. Lupton, Walkersville, Md., and David E. Reed, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 55,821, Jul. 9, 1979, abandoned. This application May 2, 1980, Ser. No. 146,141

Int. Cl.[3] A61K *39/265*

U.S. Cl. 424—89 8 Claims

1. A parenteral vaccine in injectable dose form for prevention in bovines of infectious bovine rhinotracheitis (IBR), characterized by containing an effective IBR disease-preventing amount of IBR viral envelope protein, said viral envelope protein having been obtained by propagating virulent IBR virus in a cell culture medium containing growing cells capable of promoting the multiplication of said virus, said IBR viral envelope protein collecting on the membranes of said cells during said propagation, separating the infected cells from the mixture, contacting the cellular membranes of the separated cells with an aqueous solution of a non-ionic detergent to obtain an aqueous solution of said viral envelope protein, and

separating said aqueous solution containing the solubilized viral envelope protein from the non-solubilized residue.

4,291,020

INACTIVATION OF NON-A, NON-B HEPATITIS AGENT

Edward Tabor, Rockville, and Robert J. Gerety, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of Health & Human Services, Washington, D.C.

Filed May 16, 1980, Ser. No. 150,320

Int. Cl.[3] **A61K** *39/29*

U.S. Cl. 424—89 **4 Claims**

1. A method of treating an agent of human non-A, non-B hepatitis virus with formalin at a concentration of 1:1,000–1:10,000 for 24–120 hours to inactivate said agent.

4,291,021

NOVEL MACROLIDE ANTIBIOTICS AND PREPARATION THEREOF

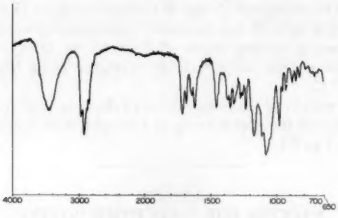
Masaru Otani; Shuzo Satoi; Naoki Muto; Tetsu Saito, all of Shizuoka; Tadashiro Fujii, Mishima; Seiji Katsumata, Susono; Mitsuo Hayashi, and Masaru Ono, both of Shizuoka, all of Japan, assignors to Toyo Jozo Company, Ltd., Shizuoka, Japan

Filed May 10, 1979, Ser. No. 37,846

Claims priority, application Japan, May 10, 1978, 53-54373; Mar. 2, 1979, 54-24788; Mar. 16, 1979, 54-31316

Int. Cl.[3] **C12P** *19/60;* **A61K** *35/74*

U.S. Cl. 424—121 **11 Claims**



1. A novel antibiotic substance A 11725 I or a pharmaceutically acceptable salt thereof having the following properties:

Appearance: white powders;

Molecular formula: $C_{37}H_{61}NO_{12}$;

Molecular weight: 711;

Melting point: 103° to 107° C.;

$[\alpha]_D$: −40.0° (C=1, methanol);

Ultra-violet absorption spectrum: as shown in FIG. 3;

Infra-red absorption spectrum: as shown in FIG. 1;

Nuclear magnetic resonance spectrum: as shown in FIG. 5;

Coloration reaction:

Discoloration of aqueous potassium permanganate solution: +;

Ninhydrin reaction, Sakaguchi's reaction and ferric chloride reaction: −;

Acid or basic nature: Basic;

Solubility: soluble in acidic water, methanol, acetone, ethyl acetate and benzene, difficulty soluble in basic water.

4,291,022

ORGANIC COMPOUNDS

Edmond Sandrin, Riehen, and Wilfried Bauer, Lampenberg, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

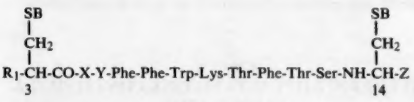
Continuation-in-part of Ser. No. 84,661, Oct. 15, 1979, which is a continuation of Ser. No. 915,181, Jun. 14, 1978, abandoned, which is a continuation of Ser. No. 829,855, Sep. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 663,824, Mar. 4, 1976, abandoned. This application May 23, 1980, Ser. No. 152,706

Claims priority, application Switzerland, Mar. 11, 1975, 3055/75; Mar. 20, 1975, 3572/75; Aug. 14, 1975, 10610/75; Sep. 22, 1975, 12282/75; Sep. 29, 1975, 12586/75; Nov. 21, 1975, 15117/75; Nov. 21, 1975, 15118/75; Nov. 21, 1975, 15119/75; Nov. 25, 1975, 15252/75

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **7 Claims**

1. A compound of formula I,



wherein R_1 is

(i) H,

(ii) NH_2,

(iii) H—Ala—NH—; H—Tyr—NH—; H—Cys—NH—; H—Val—NH—; H—Lys—NH—; H—(α-amino-isobutyryl)—NH—; H—Phe—NH

(iv) NH_2—NH—CO—NH—;

(v) C_6H_5.NH—CO—Gly—NH—; H—Ala—Gly—NH—; H—Val—Gly—NH—; H—α—phenyl—Gly—NH—,

(vi) R_2—A—CO—NH—,

wherein

R_2 is lower alkyl, phenyl, or phenyl substituted by halogen, hydroxy, amino lower alkyl or lower alkoxy,

A is a direct bond, alkylene containing up to 6 carbon atoms or —NH—,

(vii) R_2—Ala—NH—; R_2—Ala—Gly—NH—; wherein R_2 is as defined above,

(viii) $C_6H_5.A^1.CO—M—NH—$,

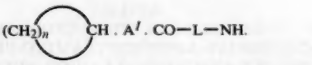
wherein

A^1 is an alkylene chain of up to 6 carbon atoms, and

—M— is —(mono- or di-Hal)—Phe, —Gly— or —Ala—,

(ix) T—(mono- or di-Hal)—Phe—NH, wherein T— is H—, H—Val— or benzoyl—,

(x)



wherein

A^1 is as defined above, and

—L— is —Val—(mono- or di-Hal)— Phe—α—phenyl—Gly—, and

n is an integer between 4 and 10,

each B is hydrogen or the two radicals B form a direct bond,

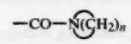
X is —Lys—, or —Nle—, and

Y is —Asn—, —Gln— or —Thr—, and

Z signifies the radicals:

(i) —CO—asparaginol; —CO—leucinol; —CO—isoleucinol; —CO—valinol; —CO—norleucinol; —CO—glutaminol; —CO—threoninol;

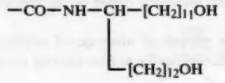
(ii) —CO—Leu; —CO—Ser; —CO—Iso—Leu; —CO—Val, and their corresponding amides, wherein the amide portion signifies the radical —CO—NR_4R_5 (wherein R_4 and R_5 independently are hydrogen or lower alkyl) or the radical



(wherein n is as defined above);

(iii) —CO—ThrOR$_3$ or —CO—SerOR$_3$ (wherein R$_3$ is lower alkyl); or

(iv) —CO—NH—(CH$_2$)$_k$—OH (wherein k is an integer between 2 and 6), or



(wherein 1_1 and 1_2 independently signify a whole number from 1 to 6); wherein in formula I the unit containing radicals R$_1$, X, Y and Z, as well as in the remaining units of the peptide sequence, at least one unit may be present in D form,

with the proviso that when R$_1$ is H—Cys—NH or H—(D-)—Cys—NH, B—B is other than a direct bond,

or a pharmaceutically acceptable acid addition salt or complex thereof.

4,291,023

METHOD FOR TREATING TUMORS USING CIS-DIAMMINEPLATINUM (II) ORGANOPHOSPHATE COMPLEXES

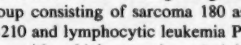
James D. Hoeschele, Oak Ridge, Tenn., and Alan R. Amundsen, Somerville, N.J., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

Division of Ser. No. 17,992, Mar. 9, 1979, Pat. No. 4,234,499. This application Dec. 26, 1979, Ser. No. 106,440

Int. Cl.[3] **A61K** *31/70, 31/685, 31/66, 31/28*

U.S. Cl. 424—180 **11 Claims**

1. A method for treating malignant tumors selected from the group consisting of sarcoma 180 ascites, lymphoid leukemia L1210 and lymphocytic leukemia P388 in a mammal afflicted therewith, which comprises administering to said mammal an effective amount of a platinum(II) organophosphate complex for treating said tumors, said complex having a structure of the formula:



wherein R^1(OPO$_3$)$_z$ is an organophosphate moiety in which R^1 is selected from the group consisting of the monovalent residue of glycerol and the monovalent or divalent residue of a monosaccharide; y is an integer having a value of from about 0.4–0.9; and z is 1 or 2.

4,291,024

CYTOTOXIC LIPONUCLEOTIDE ANALOGS

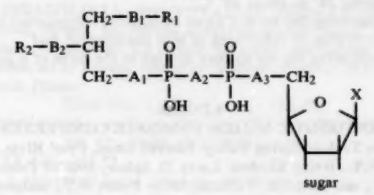
Joseph G. Turcotte, 30 Greenwood Dr, Peace Dale, R.I. 02879

Continuation of Ser. No. 895,231, Apr. 10, 1978, abandoned. This application Jan. 18, 1980, Ser. No. 113,403

Int. Cl.[3] **A61K** *31/70;* **C07H** *19/10, 19/20*

U.S. Cl. 424—180 **13 Claims**

1. A compound selected from the group consisting of compounds of the formula:



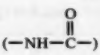
in which:

R$_1$ and R$_2$ are each predominantly straight, saturated or unsaturated multispecies fatty chains of 6–24 carbon atoms each;

at least one of A$_1$, A$_2$ and A$_3$ is methylene and the others of A$_1$, A$_2$ and A$_3$ are each independently divalent oxygen or methylene;

B$_1$ and B$_2$ are each independently divalent oxygen (—O—), methylene (—CH$_2$—), ester

or amide



functions;

X is a nucleoside base selected from the group consisting of cytosine, uracil, thymine, adenine, guanine, dihydrouracil, 5-fluorouracil, 5-azauracil, 6-azauracil, 5-azacytosine, 6-azacytosine, tetrahydropyridine dione, 2-amino tetrahydropyridine dione, 6-mercaptopurine, thioguanine, selenoguanine, 8-azaadenine-7-carboxamide and N-methyl-2-amino-1,2,4-triazolopurine;

sugar is selected from the group consisting of ribose, deoxyribose, lyxose, xylose and arabinose, provided that the sugar is not ribose or deoxyribose when the heterocycle is cytosine;

and their physiologically acceptable acid addition salts.

7. A pharmaceutical composition comprising a safe and cytotoxically effective amount of a compound according to claim **1** in combination with a pharmaceutically acceptable carrier.

4,291,025

AGAR GEL TOPICAL DRESSING

Michael A. Pellico, Los Angeles, Calif., assignor to Laclede Professional Products, Inc., Brooklyn, N.Y.

Filed Apr. 11, 1980, Ser. No. 139,500

Int. Cl.[3] **A01N** *31/00;* **A61K** *31/70*

U.S. Cl. 424—180 **13 Claims**

1. An agar gel topical dressing, which comprises about 5 to about 12 wt.% agar, about 20 to about 75 wt.% diethylene glycol and water to 100 wt.%.

4. A method for preparing a thermally reversible, agar gel topical dressing having a gelation temperature from about 24° to abour 49° C, which comprises heating and agitating an admixture containing about 5 to about 12 wt.% agar, about 20 to about 75 wt.% diethylene glycol and water to 100 wt.% to solubilize the agar and allowing the resulting solution to cool and set in the form of a gel.

8. A method for applying an agar gel topical dressing to a burn area or other area of skin impairment, which comprises:

(a) heating a thermally reversible, agar gel topical dressing containing about 5 to about 12 wt.% agar, about 20 to about 75 wt.% diethylene glycol and water to 100 wt.%

to obtain a sol, said sol having a gelation temperature from about 24° to about 49° C.;

(b) applying the sol at a tissue compatible temperature to the burn area or other area of skin impairment; and

(c) allowing the sol to cool and set in the form of a gel.

4,291,026

ANTIBIOTIC BM123ν PAMOATE COMPLEXES

Martin Tobkes, Spring Valley; Murray Dann, Pearl River, both of N.Y.; Irving Klothen; Larry D. Spicer, both of Princeton, N.J., and David R. Williams, Stony Point, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 28, 1979, Ser. No. 70,460

Int. Cl.³ A61K *31/71*

U.S. Cl. 424—181 **12 Claims**

1. A process of recovering an antibiotic trans-BM123ν pamoate complex from a fermentation whole harvest mash containing the antibiotic trans-BM123ν which comprises the steps of:

(a) producing a fermentation liquor by clarifying the whole harvest mash; and

(b) adding a water soluble pamoate salt selected from the group consisting of ammonium pamoate, alkali metal pamoate, alkaline earth metal pamoate and combinations thereof while maintaining the liquor at a pH of from 4.0 to 8.0 by addition of a pharmacologically acceptable acid, or base, and

(c) removing the precipitated antibiotic trans-BM123ν pamoate complex; and

(d) drying the antibiotic trans-BM123ν pamoate complex.

4,291,027

METHOD FOR TREATING TUMORS WITH ETHYLENEDIAMINE PLATINUM (II) AND 1,2-DIAMINOCYCLOHEXANE-PLATINUM (II) PYROPHOSPHATE COMPLEXES

James D. Hoeschel, Oak Ridge, Tenn., and Alan R. Amundsen, Somerville, N.J., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

Division of Ser. No. 17,993, Mar. 7, 1979, Pat. No. 4,234,500. This application Dec. 26, 1979, Ser. No. 106,439

Int. Cl.³ A61K *31/685, 31/66, 31/28*

U.S. Cl. 424—197 **5 Claims**

1. A method for treating malignant sarcoma 180 ascites, lymphoid leukemia L1210, lymphocytic leukemia P388 or B16 melanoma tumors in a mammal afflicted therewith which comprises administering to said mammal an effective amount of an amine platinum(II) pyrophosphate complex useful for treating said tumors, said complex having a structure of the formula:

$$[\{Pt(A)\}_2P_2O_7]$$

wherein A is a diamine of the formula: NR^1R^2—CHR^3—$CHR^4NR^5R^6$ in which R^1–R^6, taken separately, are selected from hydrogen or lower alkyl and R^3 and R^4, taken together, represent the divalent radical: —CHR^7—CHR^8—CHR^9—CHR^{10}— wherein R^7–R^{10} are selected from the group consisting of hydrogen and lower alkyl.

4,291,028

FOLLICULAR PHASE ESTROGEN OR PROGESTIN WITH PHYSIOLOGIC ESTROGEN/PROGESTIN LUTEAL PHASE REPLACEMENT DRUG DELIVERY SYSTEM

Nichols Vorys, 336 S. Columbia Ave., Columbus, Ohio 43209

Continuation of Ser. No. 865,851, Dec. 30, 1977, abandoned. This application Oct. 11, 1979, Ser. No. 83,636

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—238 **9 Claims**

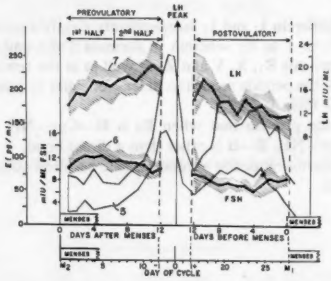
1. A treatment method for regulating the menstrual cycle of a presenting patient, the menstrual cycle having a first occurring follicular phase followed by a luteal phase, and the patient having a presenting endogenous estrogen characteristic, comprising:

(A) determining the presenting endogenous estrogen characteristic of the patient and identifying the patient's presenting endogenous estrogen characteristic as one of (1) euestrogenic, (2) hyperestrogenic, (3) hypoestrogenic;

(B) administering to the patient effective dosages of pharmacologically active steroid compositions in an ordered temporal succession based on the identified endogenous estrogen characteristic of the patient, in which succession:

(1) during the follicular phase of the menstrual cycle there is:

(a) a first period of absence of administration of any pharmacologically active steroid composition; and



(b) a following period of administration of a low dose of one pharmacologically active steroid composition adapted to the identified endogenous estrogen characteristic of the patient and selected from the group of estrogenic active steroids and progestational active steroids; and

(2) during the luteal phase of the menstrual cycle, there is administered an effective dosage of a pharmacologically active composition which comprises a combination of an estrogenic active steroid and a progestational active steroid;

whereby a follicular and luteal phase correspondence is established between the pharmacological activity characteristics of the compositions administered and the menstrual cycle of the patient.

4,291,029

6β,7β;15,16-DIMETHYLENE-1,4-ANDROSTADIEN-3-ONES, THEIR PREPARATION AND USE AS MEDICINAL AGENTS

Rudolf Wiechert; Dieter Bittler; Ulrich Kerb; Klaus Prezewowsky; Jorge Casals-Stenzel, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

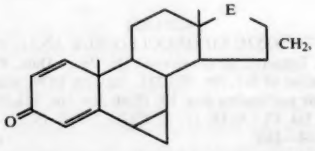
Filed May 29, 1980, Ser. No. 154,194

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922500

Int. Cl.³ A61K *31/33;* C07J *1/00*

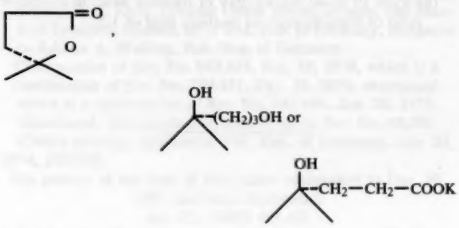
U.S. Cl. 424—238 **10 Claims**

1. A 6β,7β;15,16-dimethylene-1,4-androstadien-3-one of the formula



wherein

the 15,16-methylene group is in the α- or β-position, and E is



7. A method of achieving a diuretic effect in a patient in need of such treatment comprising administering to the patient a diuretically effective amount of a compound of claim 1.

4,291,030

METHOD OF LOWERING BLOOD CHOLESTEROL

Michael G. Mulinos, Westfield, N.J., assignor to Unimed, Inc., Somerville, N.J.

Filed Jul. 25, 1980, Ser. No. 172,132
Int. Cl.³ A61K *31/555*
U.S. Cl. 424—245 **4 Claims**

1. Method of reducing blood cholesterol in an animal in need of such treatment, which comprises administering to said animal a blood cholesterol lowering effective amount of a spirogermanium selected from the group consisting of dimethyl spirogermanium, deithyl spirogermanium dipropyl spirogermanium and dibutyl spirogermanium.

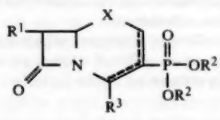
4,291,031

3-PHOSPHONOCEPHALOSPORANIC ACID DERIVATIVES, AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Takao Takaya, Kawanishi, and Toshiyuki Chiba, Osaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 7, 1980, Ser. No. 119,437
Claims priority, application United Kingdom, Feb. 19, 1979, 05790/79
Int. Cl.³ C07D *501/20*
U.S. Cl. 424—246 **17 Claims**

1. A compound of the formula:



(I)

wherein
R^1 is acylamino,
R^2 is hydrogen or lower alkyl,
R^3 is carboxy or a protected carboxy group,
X is —S—or

and the dotted line bridging the 2 to 4-positions of the formula indicates that the compound may be 2 or 3-cephem derivative, and
pharmaceutically acceptable salts thereof.

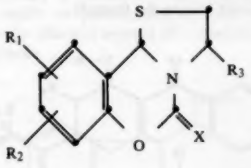
4,291,032

THIAZOLO(3,2-c)BENZOXAZINE DERIVATIVES

Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Claude Moutonnier, Le Plessis Robinson, and Gerard Wolff, Thiais, all of France, assignors to Rhone Poulenc Industries, Paris, France

Filed Oct. 2, 1980, Ser. No. 192,988
Claims priority, application France, Oct. 5, 1979, 79 24833
Int. Cl.³ A61K *43/90*; C07D *513/04*
U.S. Cl. 424—248.51 **6 Claims**

1. A thiazolo[3,2-c]-1,3-benzoxazine derivative of the formula:



in which X represents an oxygen or sulfur atom, the symbols R_1 and R_2, which are identical or different, each represent a hydrogen or halogen atom or an alkyl, alkoxy, alkylthio or trifluoromethyl radical, in the 7-, 8-, 9- or 10-position, and R_3 represents a hydrogen atom or a carboxyl radical, the alkyl radicals and portions being linear or branched and containing 1 to 4 carbon atoms, and also its metal salts and its addition salts with nitrogen-containing organic bases, in the case where R_3 represents a carboxyl radical, in its diastereoisomeric forms and mixtures thereof.

6. A pharmaceutical composition which contains a thiazolo[3,2-c]-1,3-benzoxazine derivative as claimed in claim 1 or, if appropriate, a pharmaceutically acceptable salt of this product, in association with at least one pharmaceutically acceptable diluent.

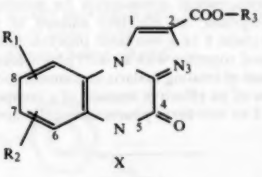
4,291,033

OXOIMIDAZOQUINOXALINES

Alan C. Barnes, Cirencester, and David P. Kay, Swindon, both of Great Britain, assignors to Roussel Uclaf, Paris, France

Filed Feb. 4, 1980, Ser. No. 118,522
Claims priority, application United Kingdom, Feb. 9, 1979, 04648/79; Jun. 7, 1979, 19847/79
Int. Cl.³ C07D *487/04*; A61K *31/495*
U.S. Cl. 424—250 **15 Claims**

1. A compound selected from the group consisting of oximidazoquinoxalines of the formula



wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, chlorine and bromine, X is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 5 carbon atoms and cycloalkylalkyl of 4 to 6 carbon atoms, R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkali metal, alkaline earth metal, aluminum, —NH_4 and non-toxic, pharmaceutically acceptable organic amine and their non-toxic, pharmaceutically acceptable acid addition salts.

11. A method of treating allergic symptoms in warm-blooded animals comprising administering to warm-blooded

animals an antiallergically effective amount of a compound of claim 1.

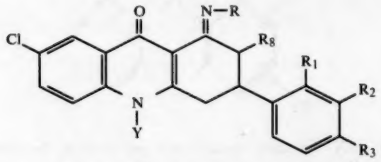
4,291,034

7-CHLORO-3-SUBSTITUTED ARYL-3,4-DIHYDRO-1,9(2H,10H) AND 10 HYDROXY ACRIDINEDIONEIMINES HAVING ANTIMALARIAL ACTIVITY

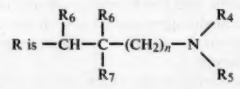
Leslie M. Werbel, Ann Arbor, Mich., assignor to Warner Lambert Company, Morris Plains, N.J.

Filed Mar. 20, 1980, Ser. No. 132,362
Int. Cl.³ A61K *31/47;* **C07D** *219/08*
U.S. Cl. 424—250 **12 Claims**

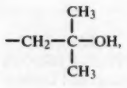
1. A compound having the formula



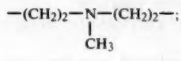
where Y is hydrogen or hydroxy; R_1 is hydrogen, fluorine, chlorine, bromine or iodine; R_2 and R_3 are hydrogen, fluorine, chlorine, bromine, iodine or trifluoromethyl;



wherein n=0 to 5; R_4 and R_5 are hydrogen, alkyl containing one to four carbon atoms, $-CH_2-CH_2-OH$,



allyl, or R_4 and R_5 together are $(CH_2)_4$ to $_5$, or



R_6 and R_7 are hydrogen, methyl, or ethyl; R_8 is hydrogen or methyl; and pharmaceutically acceptable salts thereof.

11. A pharmaceutical composition for treating malaria in mammals comprising an effective amount of a compound according to claim 1 or a non-toxic pharmaceutically acceptable salt thereof, together with an inert pharmaceutical carrier.

12. A method of treating malaria in mammals comprising the administration of an effective amount of a compound according to claim 1 or non-toxic pharmaceutically acceptable salts thereof.

4,291,035

PHARMACEUTICAL COMPOSITIONS COMPRISING TRIMETHOPRIM AND N-ETHYL-γ-PYRIDONE-3-CARBOXYLIC ACID DERIVATIVES

Alfio Bertolini, Scandiano, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jul. 11, 1979, Ser. No. 56,657
Claims priority, application Italy, Jul. 13, 1978, 50274 A/78
Int. Cl.³ A61K *31/505, 31/47, 31/44*
U.S. Cl. 424—251 **2 Claims**

2. A therapeutical method for treating a patient suffering from a bacterial infection of the urinary tract, which comprises administering to said patient

(a) from 2 to 8 mg/kg/day of trimethoprim, and

(b) from 10 to 40 mg/kg/day of oxolinic acid, in a weight ratio of trimethoprim to oxolinic acid of 1:5.

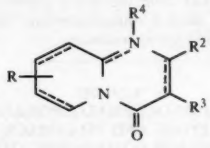
4,291,036

PYRIDO[1,2-A]PYRIMIDINE DERIVATIVES AND METHOD OF ANALGESIC TREATMENT

Jozsef Knoll; Zoltan Meszaros; Istvan Hermecz, all of Budapest; Ferenc Fülöp; Gabor Bernath, both of Szeged; Sandor Virag, Budapest; Gabor Nagy, Budapest, and Peter Szentmiklosi, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 934,801, Aug. 17, 1978, Pat. No. 4,219,649. This application Mar. 14, 1980, Ser. No. 130,371
Claims priority, application Hungary, Aug. 19, 1977, CI 1765
Int. Cl.³ A61K *31/505;* **C07D** *487/04*
U.S. Cl. 424—251 **4 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof wherein

R is carboxy in the 6-, 7- or 8-position or lower alkoxycarbonyl in the 6-, 7- or 8-position;

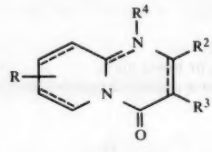
R^2 is C_1 to C_6 alkyl;

R^3 is C_1 to C_6 alkyl; and

R^4 is a single election pair, hydrogen or lower alkyl; and the dotted lines represent saturated or unsaturated bonds.

2. 2-methyl-3-ethyl-8-ethoxycarbonyl-4-oxo-4H-pyrido(1,2-a)pyrimidine or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

3. An analgesic method of treatment which comprises the step of administering to an afflicted animal an analgesically effective amount of a compound of the formula



or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof, wherein

R is carboxy in the 6-, 7- or 8-position or lower alkoxycarbonyl in the 6-, 7- or 8-position;

R^2 is C_1 to C_6 alkyl;

R^3 is C_1 to C_6 alkyl; and

R^4 is a single electron pair, hydrogen or lower alkyl; and the dotted lines represent saturated or unsaturated bonds.

4,291,037

7-(OXOALKYL)-1,3-DI-N-ISO-PROPYL XANTHINES AND THEIR PRODUCTION

Günther Brenner, Erkrath-Unterbach; Joachim Goring, Gronau; Eskendar Ali Khan, Gronau; Oskar Rohte, Gronau, and Manfred Tauscher, Gronau, all of Fed. Rep. of Germany, assignors to Johann A. Wulfing, Fed. Rep. of Germany

Continuation of Ser. No. 943,815, Sep. 19, 1978, which is a continuation of Ser. No. 753,931, Dec. 23, 1976, abandoned, which is a continuation of Ser. No. 542,449, Jan. 20, 1975, abandoned. This application Jun. 4, 1979, Ser. No. 45,381

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1974, 2402908

The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.

Int. Cl.[3] **C07D** *473/08*

U.S. Cl. 424—253 **18 Claims**

1. 7-(1-methyl-3-oxobutyl)-1,3-di-isopropyl xanthine.

4,291,038

CEREBRAL VASODILATING 20,21-DINOREBURNAMENINE DERIVATIVES

Andre Farcilli, Rosny-sous-Bois; Italo Medici, [illegible]ndy; Robert Fournex, Paris, all of France, and Fernando Barzaghi, Monza, Italy, assignors to Roussel Uclaf, Romainville, France

Continuation of Ser. No. 879,387, Feb. 21, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 137,913

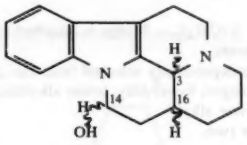
Claims priority, application France, Feb. 22, 1977, 77 05067

Int. Cl.[3] **A61K** *31/445;* **C07D** *461/00*

U.S. Cl. 424—256 **16 Claims**

1. A compound selected from the group consisting of compounds having the formula I

(I)



wherein the hydroxyl in the 14-position of the molecule is in either of the two possible positions at the carbon atom in the 14-position and the hydrogens in the 3-position and the 16-position of the molecule are in cis- or in trans-position to each other, racemates and mixtures thereof or a pharmaceutically-acceptable acid addition salt thereof.

16. A method of treatment of cerebral vascular disorders and cerebral syndroms provoked by an alteration of the cerebral vascular circulation which comprises the step of administering to a human being in need of such treatment an effective vasodilating amount of a compound as defined in claim **6**.

4,291,039

TETRAHYDRO β-CARBOLINES HAVING ANTI-HYPERTENSIVE ACTIVITY

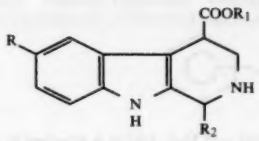
John W. Van Dyke, Jr., and Elva Kurchacova, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 8, 1980, Ser. No. 176,407

Int. Cl.[3] **C07D** *487/14;* **A01N** *43/44*

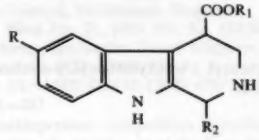
U.S. Cl. 424—256 **8 Claims**

1. Tetrahydro β-carbolines of the formula:



wherein R is H, OCH_3 or F, R_1 is H or CH_3 and R_2 is COOH or $COOCH_3$.

5. A method of treating hypertension in an individual for whom such therapy is indicated which method comprises administering orally or parenterally to such individual an antihypertensively effective amount of a compound characterized by the formula:



wherein R is H, OCH_3 or F; R_1 is H or CH_3 and R_2 is COOH or $COOCH_3$.

4,291,040

MERCAPTOACYL DERIVATIVES OF 4-DISUBSTITUTED PROLINES AND 4-SUBSTITUTED DEHYDROPROLINES

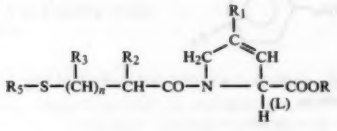
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 22, 1979, Ser. No. 86,905

Int. Cl.[3] **A61K** *31/40;* **C07D** *201/277, 401/06*

U.S. Cl. 424—263 **17 Claims**

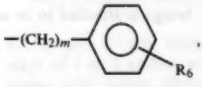
1. A compound of the formula



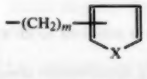
and pharmaceutically acceptable salts thereof wherein

R is hydrogen or lower alkyl;

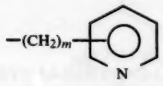
R_1 is lower alkenyl, lower alkynyl,



$-(CH_2)_m$-cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbon atoms, α-naphthyl, β-naphthyl,



wherein said $-(CH_2)_m-$ bridge is attached to an available carbon atom, or



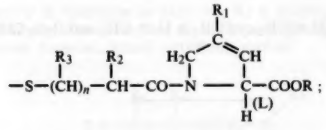
wherein said —$(CH_2)_m$ bridge is attached to an available carbon atom;

R_2 and R_3 are independently selected from the group consisting of hydrogen, lower aikyl, lower alkylthio, and halo substituted lower alkyl;

n is zero, one or two;

R_5 is hydrogen,

p-methoxybenzyl, t-butoxycarbonyl, p-methoxybenzyloxycarbonyl, or

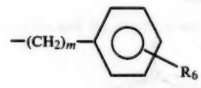


R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, fluoro, bromo, trifluoromethyl or hydroxy;

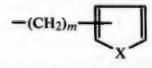
m is zero, one, two or three;

X is O or S; and

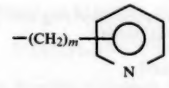
R_7 is lower alkyl of 1 to 6 carbons, lower alkyl substituted with one or more chloro, bromo or fluoro groups,



—$(CH_2)_m$-cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbons,

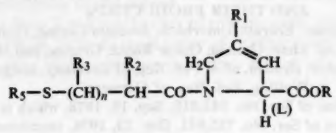


wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom, or



wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom.

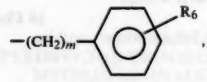
16. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and one or more hypotensive agents of the formula



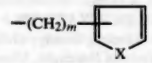
and pharmaceutically acceptable salts thereof wherein

R is hydrogen or lower alkyl;

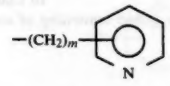
R_1 is lower alkenyl, lower alkynyl,



—$(CH_2)_m$—cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbon atoms, α-naphthyl, β-naphthyl,



wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom, or

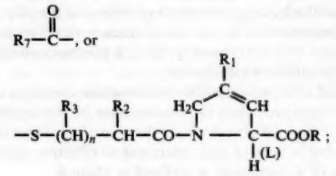


wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom;

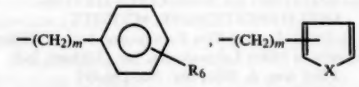
R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alky, lower alkylthio, and halo substituted lower alkyl;

n is zero, one or two;

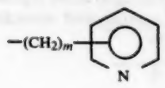
R_5 is hydrogen,



R_7 is lower alkyl of 1 to 6 carbons, lower alkyl substituted with one or more chloro, bromo or fluoro groups, —$(CH_2)_m$cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbons



wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom, and



wherein said —$(CH_2)_m$— bridge is attached to an available carbon atom;

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, fluoro, bromo, trifluoromethyl, or hydroxy;

m is zero, one, two or three; and

X is O or S.

4,291,041

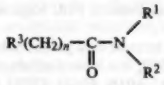
ALICYCLIC PIPERIDINE DERIVATIVES AS INSECT REPELLENTS

Terrence P. McGovern, Bowie, Md., and Carl E. Schreck, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

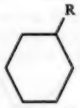
Filed Feb. 2, 1979, Ser. No. 8,814
Int. Cl.[3] A01N *43/40*; C07D *295/18*
U.S. Cl. 424—267 **7 Claims**

1. In an insect repellent composition containing an insect repelling effective amount of an active ingredient and a carrier, the improvement wherein said active ingredient is selected from the group consisting of

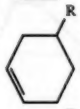
(a) a compound of the, formula



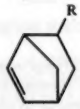
wherein R^3 is one of the groups, A, B, or C



(A)



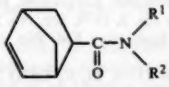
(B)



(C)

R is hydrogen or lower alkyl, n the positive integer one, two, or three, and R^1 and R^2 together with the N is selected from the group consisting of 1-piperidyl, 2-methyl-1-piperidyl, 3-methyl-1-piperidyl, 4-methyl-1-piperidyl, 2-ethyl-1-piperidyl, and 2,6-dimethyl-1-piperidyl;

(b) a compound of the formula



wherein R^1 and R^2 taken together with the N is 2-methyl-1-piperidyl, 3-methyl-1-piperidyl, 4-methyl-1-piperidyl, 2-ethyl-1-piperidyl or 2,6-dimethyl-1-piperidyl.

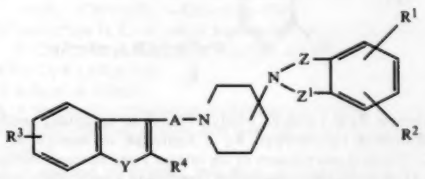
4,291,042

ANTIDEPRESSANT PIPERIDINE DERIVATIVES

Terence J. Ward, Cippenham, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Jan. 21, 1980, Ser. No. 113,938
Claims priority, application United Kingdom, Jan. 26, 1979, 02824/79; Oct. 16, 1979, 35865/79
Int. Cl.[3] A61K *31/445*; C07D *409/14, 401/14*
U.S. Cl. 424—267 **25 Claims**

21. An antidepressant composition comprising an antidepressant amount of a compound of the formula:

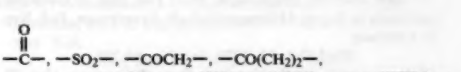


or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof, wherein the piperidine ring is substituted in the 3- or 4-position and in which

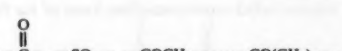
Y is —NR^5—, —O—, or —S—, where R^5 is hydrogen or alkyl of 1 to 6 carbon atoms;

A is alkylene of 1 to 6 carbon atoms or hydroxyalkylene of 1 to 6 carbon atoms;

Z is



Z^1 is



R^1, R^2 and R^3 are, independently, hydrogen, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro, amino, alkylamino of 1 to 6 carbon atoms, trifluoromethyl, alkanoylamino of 2 to 6 carbon atoms, hydroxy, or phenylalkoxy of 7 to 12 carbon atoms;

or

R^1 and R^2 taken together with adjacent carbon atoms to which they are attached form a six membered carbocyclic ring;

and

R^4 is hydrogen or alkyl of 1 to 6 carbon atoms; with the proviso that when A is —CH_2—, R^1 and R^2 are other than nitro;

and a pharmaceutically acceptable carrier.

4,291,043

1-N,N-DIMETHYLCARBAMOYL-3(5)-ALKYL-5(3)-ALKYLTHIOALKYLTHIO-1,2,4-TRIAZOLES, A PROCESS FOR THEIR MANUFACTURE, COMPOSITIONS WHICH CONTAIN THEM AND THEIR USE IN PEST CONTROL

Odd Kristiansen, Mölin, and Jozef Drabek, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

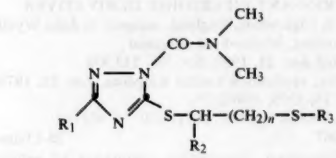
Filed Aug. 27, 1979, Ser. No. 70,215

Claims priority, application Switzerland, Sep. 6, 1978, 9374/78; Apr. 11, 1979, 3481/79; Aug. 9, 1979, 7310/79

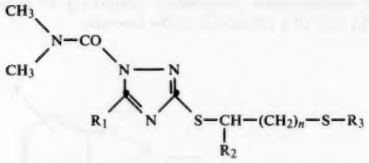
Int. Cl.³ A01N *47/38;* **C07D** *249/12*

U.S. Cl. 424—269 **13 Claims**

1. A compound of the formula IA or IB



(IA)



(IB)

wherein R_1 is i-propyl, s-butyl, t-butyl or optionally methyl substituted cyclopropyl, R_2 is hydrogen or methyl, R_3 is C_1–C_4-alkyl and n is zero or the integer 1 and mixtures thereof.

11. A pesticidal composition comprising a pesticidally effective amount of a compound as claimed in claim **1** together with an inert, solid or liquid diluent or carrier therefor.

4,291,044

COMBATING FUNGI WITH 1-(AZOL-1-YL)-2-SUBSTITUTED-ALKEN-3-ONES

Gerhard Jäger; Udo Kraatz, both of Leverkusen; Karl H. Büchel, Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

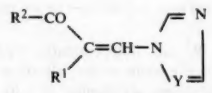
Filed Oct. 12, 1979, Ser. No. 84,208

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1978, 2846980

Int. Cl.³ A01N *43/50, 43/64;* **C07D** *233/60, 249/08*

U.S. Cl. 424—269 **12 Claims**

1. A 1-(azol-1-yl)-2-substituted-alken-3-one of the formula



in which

R^1 is phenoxy optionally substituted by halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, phenyl or halophenyl, and

R^2 is alkyl with 1 to 4 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, phenyl, or phenyl substituted with halogen, alkyl with 1 to 4 carbon atoms, haloalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, phenyl or halophenyl, and

Y is a nitrogen atom or the CH group,

or an addition product thereof with an acid or a metal salt.

4. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,291,045

METHOD OF REDUCING DENTAL CARIES

Donald A. M. Mackay, Pleasantville; Frank Witzel, Spring Valley, both of N.Y., and Harald A. B. Linke, Highland Park, N.J., assignors to Life Savers, Inc., New York, N.Y.

Continuation of Ser. No. 683,108, May 4, 1976, abandoned. This application May 23, 1980, Ser. No. 152,886

Int. Cl.³ A61K *31/425, 9/68, 7/16, 7/22*

U.S. Cl. 424—270 **2 Claims**

1. A method of inhibiting the growth of *Streptococcus mutans,* which consists essentially of the step of contacting *Streptococcus mutans* with a saccharin compound selected from the group consisting of sodium saccharin, ammonium saccharin, calcium saccharin or the free acid form of saccharin in an amount sufficient to inhibit growth of *Streptococcus mutans.*

4,291,046

PREPARATION OF NOVEL FUNGICIDALLY ACTIVE SPIRO DERIVATIVES OF 3-(3,5-DIHALOGENOPHENYL)-OXAZOLIDINE-2-THION-4-ONES

Hans-Joachim Knops, Wuppertal; Hans-Georg Heine, Krefeld; Wilfried Draber, Wuppertal, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 117,134

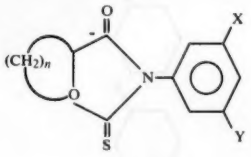
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905780

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.³ A01N *43/76;* **C07D** *263/04*

U.S. Cl. 424—272 **15 Claims**

1. A spiro derivative of 3-(3,5-dihalogenophenyl)-oxazolidine-2-thion-4-one of the formula



in which

X and Y each independently is halogen, and

n is 2 or 3.

14. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim **1**.

4,291,047

COMBATING FUNGI WITH α-AZOLYL-β-HYDROXY-KETONES

Eckart Kranz; Wolfgang Krämer; Karl H. Büchel, all of Wuppertal; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

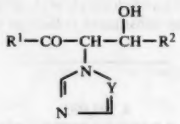
Filed Jul. 2, 1979, Ser. No. 54,061

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832233

Int. Cl.³ A01N *43/64, 43/50;* **C07D** *249/08, 233/60*

U.S. Cl. 424—273 R **10 Claims**

1. An α-azolyl-β-hydroxy-ketone of the formula



in which

R^1 is C_{1-4}-alkyl; C_{1-4}-alkyl substituted by halogen, C_{1-4}-alkyl carbonyl, phenylcarbonyloxy, halophenylcarbonyloxy, methylphenylcarbonyloxy, ethylphenylcarbonyloxy, cyanophenylcarbonyloxy, nitrophenylcarbonyloxy, halomethylphenylcarbonyloxy, haloethylphenylcarbonyloxy, C_{1-4}-alkylcarbamoyloxy, di-C_{1-4}-alkyl-carbamoyloxy, C_{1-4}-alkylsulphonyloxy, phenylsulphonyloxy, ethylphenylsulphonyloxy, halomethylphenylsulphonyloxy, haloethylphenylsulphonyloxy, cyanophenylsulphonyloxy, nitrophenylsulphonyloxy, di-C_{1-4}-alkylaminosulphonyloxy, C_{1-4}-alkoxy, phenoxy, halophenoxy, methylphenoxy, ethylphenoxy, halomethylphenoxy, haloethylphenoxy, cyanophenoxy or nitrophenoxy; phenyl; halophenyl; cyanophenyl; nitrophenyl; C_{1-4}-alkylphenyl; C_{5-7}cycloalkyl-phenyl; halomethylphenyl; haloethylphenyl; diphenyl; phenoxyphenyl; benzylphenyl; or halocyano-, and/or nitro-substituted diphenyl, phenoxyphenyl or benzylphenyl;

R^2 is $—CX^1X^2R^3$ or C_{1-4}-alkoxy-carbonyl;

R^3 is halo; or halo-C_{1-4}-alkyl with up to 3 halogen atoms; and

X^1 and X^2, which may be identical or different, each represents hydrogen or halogen, and

Y represents a nitrogen atom or the CH group,

or a physiologically acceptable metal-salt complex thereof or addition salt with an acid selected from the group consisting of hydrochloric acid, hydrobromic acid, phosphoric acid, nitric acid, sulphuric acid, acetic acid, maleic acid, succinic acid, fumaric acid, tartaric acid, citric acid, salicylic acid, sorbic acid, lactic acid, p-toluenesulphonic acid and 1,5-naphthalenedisulphonic acid.

9. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound, salt or complex according to claim **1**.

4,291,048

METHOD OF TREATING TUMORS AND CANCEROUS CACHEXIA WITH L-TRYPTOPHAN

Joseph Gold, 127 Edgemont Dr., Syracuse, N.Y. 13214

Continuation of Ser. No. 922,502, Jul. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 756,648, Jan. 4, 1977, abandoned, which is a continuation of Ser. No. 558,254, Mar. 14, 1975, abandoned, which is a continuation of Ser. No. 372,097, Jun. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 198,995, Nov. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 861,176, Sep. 25, 1969, abandoned. This application May 31, 1979, Ser. No. 44,303

Int. Cl.[3] **A61K** *31/40*

U.S. Cl. 424—274 **1 Claim**

1. A method of treating a transplanted B-16 melan- which comprises parenterally administering to a mamm- afflicted L-tryptophan in an effective amount to inhibit ... growth of said tumor.

4,291,049

ACYL ANILINES EXERTING A FUNGICIDAL ACTION

Enrico Bosone, Milan; Giovanni Camaggi, Lodi, both of Italy; Lambertus de Vries, Hilversum, Netherlands; Carlo Garavaglia, Cuggiono, Italy; Luigi Garlaschelli, Pavia, Italy; Franco Gozzo, San Donato Milanese, Italy; Jan C. Overeem, Scherpenzeel, Netherlands, and Simone Lorusso, San Giuliano Milanese, Italy, assignors to Montedison S.p.A., Milan, Italy

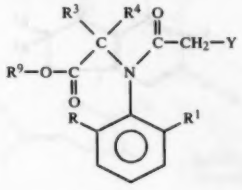
Filed Feb. 1, 1979, Ser. No. 8,584

Claims priority, application Italy, Feb. 2, 1978, 19896 A/78; Jul. 4, 1978, 25295 A/78

Int. Cl.[3] **A01N** *43/08, 43/10;* **C07D** *333/24, 307/54*

U.S. Cl. 424—275 **12 Claims**

1. Compounds having the formula:



wherein:

R and R^1, the same or different, are H; CH_3; C_2H_5; nC_3H_7; $—CH_2—CH=CH_2$; $—CH=CH—CH_3$;

R^3 and R^4 are H; C_1–C_3 alkyl; halomethyl; alkoxymethyl; Cl; F; CN; O-alkyl; S-alkyl; or together are (CH_2=);

R^9 is C_1–C_3 alkyl; and

Y is furyl or thienyl.

4. A fungicidal composition containing as active principle a fungicidally effective amount of at least one of the compounds of claim **1**.

7. A method of fighting infections of phytophatogenous fungi on useful plants, which consists in distributing a fungicidally effective amount of at least one of the compounds of claim **1** on the plants or on the soil, as such or in a fungicidal formulation.

4,291,050

6,7-DISUBSTITUTED-2 OR 2,2-SUBSTITUTED-5-SUBSTITUTED-1-INDANONES

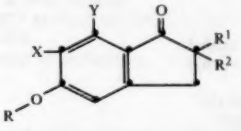
Otto W. Woltersdorf, Jr., Chalfont, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 21, 1979, Ser. No. 50,851

Int. Cl.[3] **A61K** *31/335;* **C07C** *49/67*

U.S. Cl. 424—278 **6 Claims**

1. A compound of the formula



wherein

X is halo or methyl

Y is halo or methyl;

R is

hydroxy ethyl;

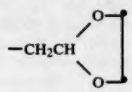
2-oxo propyl;

1,2-dihydroxypropyl, provided that X or Y is not methyl;

amino ethyl;

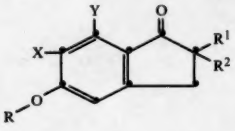
formyl methyl;

dialkoxy (C_{1-6}) methyl; or

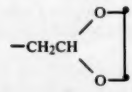


R^1 is hydrogen or C_{1-6}alkyl;
R^2 is C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl or substituted aryl wherein the substituent is halo or C_{1-3} alkyl.

5. A pharmaceutical composition useful in the treatment of edema and hypertension which comprises a anti-edema and hypertensive effective amount of a compound of the formula

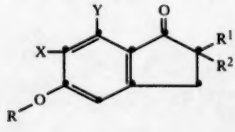


wherein
X is halo or methyl
Y is halo or methyl;
R is
hydroxy ethyl;
2-oxo propyl;
1,2-dihydroxypropyl, provided that X or Y is not methyl;
amino ethyl;
formyl methyl;
dialkoxy (C_{1-6}) methyl; or

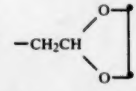


R^1 is hydrogen or C_{1-6}alkyl;
R^2 is C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl or substituted aryl wherein the substituent is halo or C_{1-3} alkyl
and a pharmaceutically inert carrier.

6. A method of treating edema and hypertension which comprises administering to a patient in need of such treatment a anti-edema and hypertensive effective amount of a compound of the formula:



wherein
X is halo or methyl
Y is halo or methyl;
R is
hydroxy ethyl;
2-oxo propyl;
1,2-dihydroxypropyl, provided that X or Y is not methyl;
amino ethyl;
formyl methyl;
dialkoxy (C_{1-6}) methyl; or



R^1 is hydrogen or C_{1-6}alkyl;
R^2 is C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl or substituted aryl wherein the substituent is halo or C_{1-3} alkyl.

4,291,051

1,5-DIMETHYL-6,7-DIOXABICYCLO[3.2.1]-OCTANE AND USE TO CONTROL PINE BEETLES

R. Marshall Wilson, Cincinnati, Ohio, and John W. Rekers, Spartanburg, S.C., assignors to Research Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,206
Int. Cl.³ A01N *43/26*; C07D *317/06*
U.S. Cl. 424—278 **3 Claims**

1. 1,5-Dimethyl-6,7-dioxabicyclo[3.2.1]octane.

3. A method of limiting the infestation of a wooded area by western or southern pine beetles comprising treating the infested area with an effective amount of a compound of claim **1**.

4,291,052

ARTHROPODICIDAL GRANULAR FORMULATION

Christopher Gillings, Linton, and John H. Palmer, Saffron Walden, both of England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 877,812, Feb. 14, 1978, Pat. No. 4,198,397. This application Dec. 31, 1979, Ser. No. 108,787
Claims priority, application United Kingdom, Feb. 16, 1977, 6366/77; Mar. 17, 1977, 1392/77; Sep. 27, 1977, 40111/77
Int. Cl.³ A01N *43/16*
U.S. Cl. 424—282 **13 Claims**

1. A method of combating corn rootworm which method comprises contacting corn rootworm with bendiocarb at a locus at which corn is growing or is to be grown by applying to the locus of corn rootworm combating amount of granules containing a corn rootworm combating amount of bendiocarb.

4,291,053

AGENT TO BE ADMINISTERED ORALLY TO DOMESTIC ANIMALS WITHOUT CELLULOSE DIGESTION IN THE RUMEN

Günter Dost, Kelkheim, and Fritz Bauer, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 790,602, Apr. 25, 1977, abandoned. This application Nov. 1, 1979, Ser. No. 90,263
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618269
Int. Cl.³ A61K *31/335*
U.S. Cl. 424—283 **14 Claims**

1. The method for the therapeutic treatment of swine dysentery caused by *Treponema hyodysenteriae* in pigs which comprises orally administering thereto an effective amount of an active agent selected from the group consisting of Salinomycin, physiologically acceptable salts thereof, and physiologically acceptable esters thereof.

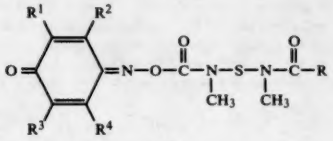
4,291,054

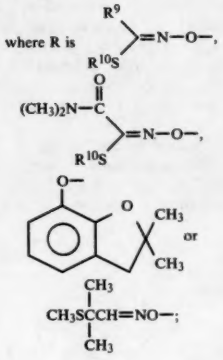
INSECTICIDAL CARBAMOYL SULFIDES

Jiin-Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1979, Ser. No. 101,799
Int. Cl.³ A01N *43/08, 37/28*; C07D *307/77, 307/82*
U.S. Cl. 424—298 **52 Claims**

1. A compound of the formula





R^1, R^2, R^3, and R^4 are independently H, F, Cl, Br, NO_2, CN, CF_3, C_1–C_{12} alkyl, C_1–C_4 alkoxy, or COR^5;

R^5 is OR^6 or NR^7R^8;

R^6 is C_1–C_4 alkyl;

R^7 is C_1–C_4 alkyl or methoxy;

R^8 is C_1–C_4 alkyl;

R^9 and R^{10} are independently methyl or ethyl; or

R^1 and R^2 are taken together to form

provided that:

(1) The total of R^9 and R^{10} is not greater than three carbon atoms;

(2) Only one of R^1, R^2, R^3 and R^4 can be CN, NO_2, COR^5, or CF_3;

(3) If R^2 and R^4 are both alkyl, then R^2 and R^4 are independently CH_3 or CH_2CH_3;

(4) If any two of R^1, R^2, R^3, and R^4 are independently halogen or alkoxy, then the other two are independently hydrogen or CH_3;

(5) The total number of carbons R^1 to R^4 is not greater than 26;

(6) If R^1 and R^2 are both alkyl, then R^2 must be CH_3 or CH_2CH_3;

(7) If R^3 and R^4 are both alkyl, then R^4 must be CH_3 or CH_2CH_3.

18. An agricultural composition for insecticidal use consisting essentially of a surfactant, diluent or combinations thereof and a compound of claim **1**.

4,291,055

INSECTICIDAL PHENOXY HYDROXAMATES

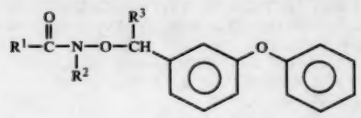
Albert C. Chen, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1980, Ser. No. 109,693

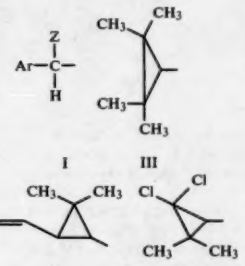
Int. Cl.³ A01N *37/28;* **C07C** *83/10*

U.S. Cl. 424—298 **18 Claims**

1. Insecticidal hydroxamates having the formula:



wherein R^1 may represent I, II, III, or IV:



wherein Ar is phenyl; phenyl substituted in the 2-to-6 position with 1–5 halogen (Cl, Br, F, I), C_1–C_4 alkyl, amino, C_1–C_4 alkylamino, C_1–C_4 dialkylamino, C_1–C_4 alkoxy, methylenedioxy, C_1–C_4 alkylthio, trifluoromethyl, trifluoromethoxy, difluoromethoxy, trifluorothiomethyl, difluorothiomethyl, C_1–C_4 haloalkyl, C_1–C_4 alkylthioalkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, cyano, C_1–C_4 cyanoalkyl, C_1–C_4 carboalkoxy, C_1–C_4 alkylsulfonyl, C_1–C_4 alkoxyalkyl, C_1–C_4 haloalkenyl, C_1–C_4 acyl, indanyl or naphthalyl; Z is C_2–C_4 alkyl, C_3–C_6 cycloalkyl, alkylcycloalkyl or C_2–C_4 alkenyl; Y is F, Cl, or Br; and R^2 and R^3 are the same or different H, alkyl, CN, CHO, C≡CH, $CH_2C{\equiv}CH$ $CH_2CH{=}CH_2$, CH_2O-alkyl, CH_2S-alkyl, or S-alkyl; alkyl being C_1–C_4; and II saturated on the vinyl group with Br.

4,291,056

PESTICIDAL ESTERS

Willy Meyer, Riehen; Jozef Drabek, Allschwil; Saleem Farooq, Aesch; Laurenz Gsell, Füllinsdorf, and Friedrich Karrer, Zofingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

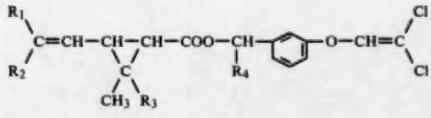
Filed Jul. 20, 1976, Ser. No. 707,136

Claims priority, application Switzerland, Jul. 28, 1975, 9859/75; Jun. 4, 1976, 7110/76

Int. Cl.³ A01N *53/00;* **C07C** *69/743, 121/75*

U.S. Cl. 424—304 **11 Claims**

1. A compound of the formula



wherein R_1 and R_2 are the same and represents a fluorine, chlorine or bromine atom or a methyl group, R_3 represents a methyl group and R_4 represents a cyano group.

7. A method for combatting insects and acarids which comprises applying to the locus thereof an insecticidally and acaricidally effective amount of a compound according to claim **1**.

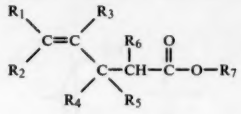
4,291,057

BIOCIDAL ESTERS OF HALO-4-ALKENOIC ACIDS

Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 54,212
Int. Cl.[3] A01N 37/06; C07C 57/03
U.S. Cl. 424—304 23 Claims

1. A composition of the formula:



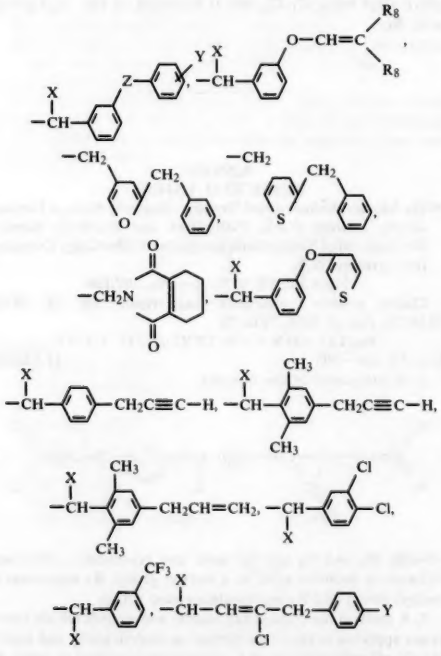
wherein

R_1, R_2, and R_3 are independently H, a lower alkyl group having from 1 to 3 carbon atoms or halogen;

R_4 and R_5 are independently H, a lower alkyl group having from 1 to 3 carbon atoms, polyhaloalkyl, haloalkyl, halogen, a lower alkenyl group having from 2 to 3 carbon atoms, a lower cycloalkyl group having from 3 to 5 carbon atoms, a lower cycloalkenyl group having from 3 to 5 carbon atoms, cyano, nitro, a lower alkoxy group having from 1 to 3 carbon atoms, arloxy, a lower alkylthio group having from 1 to 3 carbon atoms, arylthio, a lower alkylsulfinyl group having from 1 to 3 carbon atoms, arylsulfinyl, a lower alkylsulfinyl group having from 1 to 3 carbon atoms, arylsulfonyl, acylamido, or a lower dialkylamino group having from 1 to 3 carbon atoms;

R_6 is selected from the group consisting of: (1) cycloalkyl, alkenyl, branched alkenyl, or cycloalkenyl; or (2) a branched alkyl group having from 3 to 5 carbon atoms or an alkyl group having from 1 to 5 carbon atoms, with the proviso that R_4 or R_5 is other than hydrogen.

R_7 is a member selected from the group consisting of:



wherein:

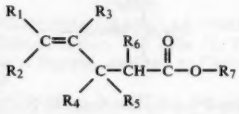
X is hydrogen, cyano, ethynyl, thiamido, a lower alkyl group having from 1 to 3 carbon atoms, a lower cycloalkyl group having from 3 to 5 carbon atoms, a lower alkenyl group having from 2 to 5 carbon atoms, a low cycloalkenyl group having from 3 to 5 carbon atoms or polyhaloalkyl;

Y is hydrogen, a lower alkyl group having from 1 to 3 carbon atoms, polyhaloalkyl, haloalkyl, halogen, cyano, nitro, a lower alkoxy group having from 1 to 3 carbon atoms, aryloxy, a lower alkylthio group having from 1 to 3 carbon atoms, arylthio, a lower alkylsulfinyl group having from 1–3 carbon atoms, arylsulfonyl, alkylsulfonyl, acylamido, or a lower dialkylamino group having from 1 to 3 carbon atoms;

R_8 is bromine or chlorine; and

Z is oxygen, sulfur or its oxides, or methylene.

17. A method of controlling insects and mites which comprises subjecting them to a lethal amount of a composition of the formula:



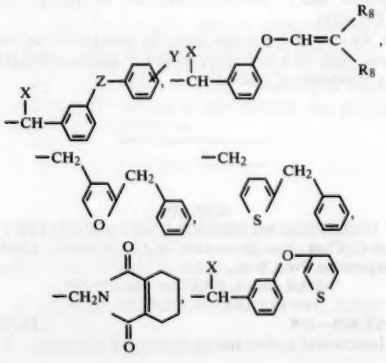
wherein

R_1, R_2, and R_3 are independently H, a lower alkyl group having from 1 to 3 carbon atoms or halogen;

R_4 and R_5 are independently H, a lower alkyl group having from 1 to 3 carbon atoms, polyhaloalkyl, haloalkyl, halogen, a lower alkenyl group having from 2 to 3 carbon atoms, a lower cycloalkyl group having from 3 to 5 carbon atoms, a lower cycloalkenyl group having from 3 to 5 carbon atoms, cyano, nitro, a lower alkoxy group having from 1 to 3 carbon atoms, arloxy, a lower alkylthio group having from 1 to 3 carbon atoms, arylthio, a lower alkylsulfinyl group having from 1 to 3 carbon atoms, arylsulfinyl, a lower alkylsulfonyl group having from 1 to 3 carbon atoms, arylsulfonyl, acylamido, or a lower dialkylamino group having from 1 to 3 carbon atoms;

R_6 is selected from the group consisting of: (1) cycloalkyl, alkenyl, branched alkenyl, or cycloalkenyl; or (2) a branched alkyl group having from 3 to 5 carbon atoms or an alkyl group having from 1 to 5 carbon atoms, with the proviso that R_4 or R_5 is other than hydrogen;

R_7 is a member selected from the group consisting of:



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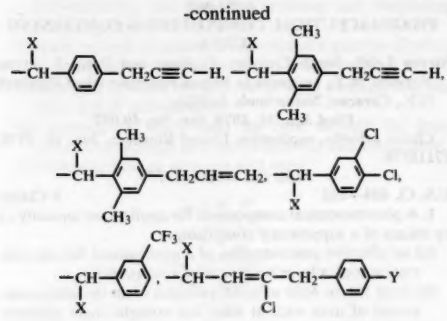


wherein:

X is hydrogen, cyano, ethynyl, thiamido, a lower alkyl group having from 1 to 3 carbon atoms, a lower cycloalkyl group having from 3 to 5 carbon atoms, a lower alkenyl group having from 2 to 5 carbon atoms, a low cycloalkenyl group having from 3 to 5 carbon atoms or polyhaloalkyl;

Y is hydrogen, a lower alkyl group having from 1 to 3 carbon atoms, polyhaloalkyl, haloalkyl, halogen, cyano, nitro, a lower alkoxy group having from 1 to 3 carbon atoms, aryloxy, a lower alkylthio group having from 1 to 3 carbon atoms, arylthio, a lower alkylsulfinyl group having from 1–3 carbon atoms, arylsulfonyl, alkylsulfonyl, acylamido, or a lower dialkylamio group having from 1 to 3 carbon atoms;

R_8 is bromine or chlorine; and

Z is oxygen, sulfur or its oxides, or methylene.

4,291,058

NAPHTHALENECARBOXYLIC ACID ESTERS

Milos Suchy, Pfaffhausen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

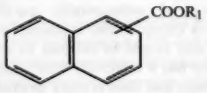
Continuation of Ser. No. 909,585, May 25, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 74,214

Claims priority, application Switzerland, Jun. 7, 1977, 6995/77

Int. Cl.[3] **A01N** *37/10*

U.S. Cl. 424—308 **3 Claims**

1. A method for the control of insects and acarids which comprises topical application to the insects and acarids of an amount of an insecticidal and acaricidal composition comprising a compatible carrier material and a compound of the formula



where R_1 is lower alkynyl which is effective as an insecticide and acaricid.

4,291,059

CYCLOALIPHATIC COMPOUNDS, ANALGESIC COMPOSITIONS THEREOF AND METHOD OF USE THEREOF AS ANALGESICS

Derek P. Reynolds, Hertfordshire, England, assignor to Glaxo Group Limited, England

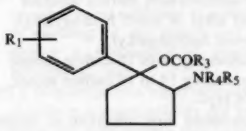
Filed Oct. 19, 1979, Ser. No. 86,333

Claims priority, application United Kingdom, Oct. 25, 1978, 41871/78; Oct. 25, 1978, 41873/78

Int. Cl.[3] **A61K** *31/55, 31/40;* **C07D** *295/10*

U.S. Cl. 424—311 **19 Claims**

1. A compound of the formula (I):



(I)

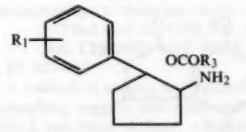
in which

R_1 represents a hydrogen atom, a halogen atom or a group OR_2, in which R_2 represents a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, an alkanoyl group containing 1 to 6 carbon atoms, an alkenoyl group containing 3 to 6 carbon atoms or a benzoyl group;

R_3 represents a hydrogen atom or an alkyl containing 1 to 6 carbon atoms, alkenyl containing 3 to 6 carbon atoms or a phenyl group;

R_4 and R_5, which may be the same or different, each represents a hydrogen atom or an alkyl containing 1 to 6 carbon atoms, alkenyl containing 3 to 6 carbon atoms or alkynyl group containing 3 to 6 carbon atoms optionally substituted by a phenyl or cycloalkyl group containing 3 to 6 carbon atoms; or R_4 and R_5 together with the nitrogen atom to which they are attached form a saturated four to seven membered ring in which said nitrogen atom is the only heteroatom in said ring; with the provisos that, when R_4 and R_5 simultaneously represent hydrogen atoms, (i) when R_1 represents a hydrogen atom, R_3 does not represent a methyl group, and (ii) the compound of formula (I) is the β-isomer, and its physiologically accepted salts.

12. A compound of the formula (I)a:



(I)a

in which R_1 represents a hydrogen atom, a halogen atom or a group OR_2 in which R_2 represents a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, an alkanoyl group containing 1 to 6 carbon atoms, an alkenoyl group containing 3 to 6 carbon atoms or a benzoyl group and R_3 represents an alkyl group containing 1 to 6 carbon atoms with the proviso that R_3 cannot be methyl when R_1 is a hydrogen atom; and its physiologically acceptable salts.

4,291,060
COMPOUNDS DERIVED FROM FORMYLPHENOXYACETIC ACID AS ANTIVIRAL AGENTS IN ANIMALS

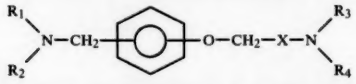
Allen R. Kraska, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 933,958, Aug. 15, 1978, abandoned. This application Feb. 5, 1979, Ser. No. 9,288

Int. Cl.[3] **A01N** *37/30, 37/18;* **C07C** *103/28, 93/06*

U.S. Cl. 424—316 **12 Claims**

1. A compound of the formula



and the non-toxic acid addition salts thereof wherein

R_1 is hydrogen, lower alkyl or lower hydroxyalkyl;

R_2 is hydrogen or lower hydroxyalkyl;

R_3 is hydrocarbyl containing 14 to 18 carbon atoms;

R_4 is hydrocarbyl containing 14 to 18 carbon atoms;

and X is —CO— or —CH_2—.

12. A process for combating viral infections in vertebrates comprising the parenteral, intranasal or topical administration of an antivirally effective amount of a compound of claim **1**.

4,291,061
1H-INDEN-1-ONE DERIVATIVES, PROCESSES FOR PRODUCING THEM, THEIR USE IN MICROBICIDAL COMPOSITIONS, AND FOR COMBATING MICROORGANISMS

Elmar Sturm, Aesch, and Robert Nyfeler, Basle, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

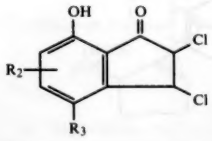
Filed Oct. 31, 1979, Ser. No. 89,830

Claims priority, application Switzerland, Nov. 6, 1978, 11528/78

Int. Cl.[3] **A01N** *35/06;* **C07C** *49/633*

U.S. Cl. 424—331 **13 Claims**

1. A 2,3-dichloro-7-hydroxy-1H-inden-1-one derivative of the formula



wherein

R_2 and R_3 independently of one another are each hydrogen fluorine, chlorine, bromine, C_1–C_4-alkyl, trifluoromethyl or nitro.

6. A microbicidal composition containing as active ingredient an effective amount of a compound according to claim **1**, together with suitable carriers.

4,291,062
PHARMACEUTICAL COMPOSITIONS CONTAINING UREA

Steven Leigh, South Croydon, England, and Peter J. Ayres, Norwich, N.Y., assignors to Phares Pharmaceutical Research N.V., Curacao, Netherlands Antilles

Filed Jun. 15, 1979, Ser. No. 49,057

Claims priority, application United Kingdom, Jun. 16, 1978, 27115/78

Int. Cl.[3] **A61K** *31/17*

U.S. Cl. 424—322 **8 Claims**

1. A pharmaceutical composition for application topically or by means of a suppository comprising:

(a) an effective concentration of a medicament for administration topically or by means of a suppository,

(b) from 5% to 40% of small particles of an inclusion compound of urea with at least one straight-chain aliphatic compound having from 4 to 30 carbon atoms per molecule,

(c) up to 50% of a powder that is inert to and insoluble in the remaining ingredients,

(d) from 25% to 90% of a carrier material which does not dissolve or react with any of components (a), (b), or (c), optionally together with a thickening agent to provide a composition of the desired consistency,

components (a), (b) and (c) being dispersed in component (d).

4,291,063
TREATMENT OF PROTEINACEOUS MATERIALS WITH ANHYDROUS AMMONIA GAS

John A. Ridgway, LaPorte, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 68,592, Aug. 22, 1979. This application Sep. 2, 1980, Ser. No. 183,206

Int. Cl.[3] **A23J** *3/00;* **A23L** *1/34*

U.S. Cl. 426—319 **9 Claims**

1. A method for improving the texture of spray-dried yeast comprising exposing the spray-dried yeast to gaseous anhydrous ammonia at a treating temperature of from about 0° C. to about 100° C. and an ammonia pressure of from about 15 to about 45 percent of the vapor pressure of liquid ammonia at the treating temperature for from about 15 minutes to about 2 hours.

4,291,064
METHOD FOR MAKING LARGE SIZED BLOCKS OF CHEESE

Wilfred F. Retzlaff, New Franken, Wis., assignor to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.

Filed Apr. 16, 1979, Ser. No. 30,119

Int. Cl.[3] **A01J** *25/11, 25/13, 25/15*

U.S. Cl. 426—397 **4 Claims**

1. A method for manufacturing blocks of cheese from cheese curd particles containing whey comprising the steps of:

(a) providing an open ended container;

(b) enclosing the bottom end of the container with a drain plate including perforations;

(c) locating a drain screen including two substantially parallel, narrowly spaced apart and fixed foraminous sidewalls centrally in said container; and applying a supporting means to said drain screen to retain said drain screen over said drain plate with the gap in said drain screen communicating with the perforations in said drain plate; said drain screen being of substantially parallel construction throughout its extent in the container and being of sufficient width and height in relation to the container such that the whey has a relatively short distance to travel to the drain screen and thus is easiy drainable over substantially the entire volume of the curd;

(d) partially filling said container with said cheese curd particles containing whey until said drain screen is sup-

ported by said curd, removing said supporting means from said container, and thereafter resuming and completing the filling step;

(e) allowing said cheese curd to settle and a quantity of whey to drain due to the weight of said cheese curd;

(f) applying pressure to said cheese curd through said top open end of said container;

(g) draining the whey from the curd through the drain screen and through said perforations of said drain plate;

(h) releasing said pressure on said curd;

(i) inverting said container;

(j) removing said drain plate and drain screen from now the top of said container;

(k) reapplying pressure to said curd through now the top open end of said container closing any remaining voids in said curd thereby, completing the interfusing of said curd producing substantially homogeneously solid block of cheese;

(l) releasing said pressure on said curd; and

(m) sealing the open ends of said container for shipping.

4,291,065

STALING RESISTANT BAKED FOOD PRODUCT

Henry F. Zobel, Darien, and James L. Maxwell, Clarendon Hills, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 892,615, Apr. 3, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,159

Int. Cl.[3] **A21D** *13/00*

U.S. Cl. 426—549 **2 Claims**

1. A staling resistant sweet baked goods food product comprising a starch, water and between 15% and 40% by weight of a maltotriose-containing sweetener composition in a solid, fine and essentially homogeneous dispersion wherein said sweetener composition comprises between 30% and 100% by weight of maltotriose.

4,291,066

PROCESS FOR PRODUCING AN AMBIENT STABLE, STARCH-CONTAINING CONCENTRATE

Pieter J. Anema, Zevenaar, Netherlands; Derek R. Haisman, Bedford, and Rose M. Adams, Wellingborough, both of England, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Dec. 6, 1979, Ser. No. 100,884

Claims priority, application United Kingdom, Dec. 7, 1978, 47554/78

Int. Cl.[3] **A23L** *1/40*

U.S. Cl. 426—578 **8 Claims**

1. A process for producing an ambient stable concentrate which on dilution with water or an aqueous liquid forms at a temperature from 65° to 100° C. into a lump-free, thick soup, sauce, gravy or dessert, which process comprises:

(1) producing a concentrate containing:

(a) water

(b) starch,

(c) a proportion of an appropriate osmotic-pressure increasing agent sufficient to substantially reduce the rate of swelling of the starch and prevent gelatinisation during a pasteurization treatment carried out at 60°–100° C., and

(d) a proportion of a water-activity depressing agent conducive to a water activity not exceeding 0.92,

(2) filling the concentrate into containers and sealing the containers, and

(3) pasteurizing the concentrate in the sealed containers at 60°to 100° C.

4,291,067

WHEY PROTEIN RECOVERY

Marcel Buhler, Tolochenaz; Mats Olofsson, Yverdon, both of Switzerland, and Pierre-Yves Fosseux, Pont-Hebert, France, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 7, 1979, Ser. No. 36,427

Claims priority, application Switzerland, May 11, 1978, 5134/78

Int. Cl.[3] **A23J** *3/00*

U.S. Cl. 426—582 **15 Claims**

1. A process for recovering proteins from lactoserum, which comprises subjecting a lactoserum to a heat treatment to denature the proteins to an extent of about 35 to 70% by weight of the proteins present in it, separating the denatured proteins from the other non-fat constituents of the lactoserum by ultrafiltration, said proteins being found in the ultrafiltration retentate along with undenatured proteins, and subjecting the retentate to a complementary heat treatment for a time and temperature sufficient for denaturing the undenatured proteins.

4,291,068

METHOD OF MAKING SEMICONDUCTOR PHOTODETECTOR WITH REDUCED TIME-CONSTANT

Terry L. Jones, Springfield, and Brian S. Miller, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1978, Ser. No. 956,315

Int. Cl.[3] **B05D** *5/12;* **H01L** *27/14, 31/00*

U.S. Cl. 427—88 **1 Claim**

1. A method of making a photocathode with at least a photon-absorbing portion and with an electron-emitting portion having a patterned surface, wherein said photocathode includes a semiconductor layer, including the steps of:

coating said layer with an insulating layer;

coating said insulating layer with an electron-sensitive layer;

scanning said electron-sensitive layer with an electron beam in a predetermined pattern;

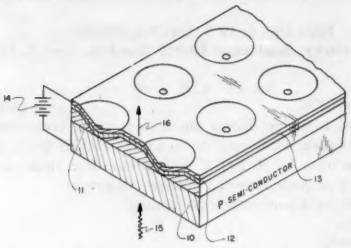
developing said scanned layer to produce a perforated mask;

etching said insulating layer through said mask to produce a dimpled surface;

removing said mask;

depositing a conductive material onto the dimpled surface to form a conductive layer with a dimpled surface;

wherein said semiconductor layer acts as the photon-absorbing



portion of said photocathode and said conductive layer acts as said electron-emitting portion of said photocathode when a voltage potential is applied therebetween to allow said photocathode to emit electrons in accordance with photons impinging thereon.

4,291,069

RENDERING POROUS STRUCTURES IMPERMEABLE BY TREATMENT WITH GELLABLE AMINE POLYMERS

Richard J. Pilny, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 20, 1977, Ser. No. 817,271

Int. Cl.[3] **B32B** *35/00*

U.S. Cl. 427—140 **13 Claims**

11. In a method for grouting sewers and water wells which comprises locating a leaking area in a subterranean conduit, isolating said leaking area with packing devices and pumping a gellable composition into and over said area, the improvement which comprises preparing said gellable composition by admixing an aqueous solution of at least five weight percent of a water-soluble amide polymer with sufficient of an aqueous solution of a water-soluble aliphatic dialdehyde to provide from about 0.01 to about 0.067 mole of dialdehyde per mole of amide monomer combined in said polymer and with sufficient of an inorganic alkaline reagent to produce a pH of greater than 7.5.

4,291,070

COATING OF PARTICLES

Stuart R. Brown, Reading; Eric A. Feest, Wallingford, and Fred Leach, Wantage, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 20, 1980, Ser. No. 208,775

Claims priority, application United Kingdom, Dec. 5, 1979, 42058/79

Int. Cl.[3] **B05D** *7/00*

U.S. Cl. 427—213 **5 Claims**

1. A method of coating metallic-particles with a ceramic material which comprises generating a fluidised bed of metallic-particles; contacting the metallic-particles in the bed with a wash-coat comprising a suspension of a non-dispersible ceramic powder in a sol of colloidal-particles convertible to the ceramic material thereby to coat the metallic-particles with the ceramic-particles and the colloidal-particles; and subsequently firing to produce a coating of the ceramic material.

4,291,071

WASHING AND SOFTENING COMPOSITIONS

Richard G. Harris, Mitford; Allan C. McRitchie, Tyne & Wear, and Alexander D. Wilson, Newcastle upon Tyne, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

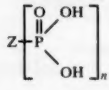
Filed Jun. 18, 1979, Ser. No. 49,677

Claims priority, application United Kingdom, Jun. 20, 1978, 27380/78

Int. Cl.[3] **C11D** *1/86, 11/00, 17/06;* **D06M** *13/46*

U.S. Cl. 427—220 **1 Claim**

1. In a process for preparing a softening and detergent composition consisting essentially of, by weight, (a) from about 3% to 30% of one or more polyethoxy nonionic surfactants having a hydrophilic-lipophilic balance in the range from about 8 to about 15 and having not more than an average of about 16 ethoxy units per molecule; (b) from about 1% to about 15% of one or more cationic textile softeners; (c) from about 10% to about 80% of one or more detergency builders selected from the group consisting of water-soluble carbonates, borates, phosphates, polyphosphates, tripolyphosphates, bicarbonates, silicates, sulfates, amino polyacetates, phytates, polycarboxylates and water-insoluble aluminosilicates; and (d) from about 0.1% to about 5% of a discoloration inhibitor which is a water-soluble polyphosphonic acid having the general formula:



or a water soluble salt thereof, where n is at least 2 and Z is a connecting organic moiety having an effective covalency equal to n; said composition being characterized in that the weight ratio of nonionic detergent to cationic textile softener is in the range from about 10:1 to about 1:1, and further characterized in that said composition optionally contains only minor amounts anionic surfactants up to a weight ratio of anionic surfactant:cationic softener less than 1:5, which process comprises the steps of: (i) preparing spray-dried carrier granules containing discoloration inhibitor component (d) and at least part of the detergency builder component (c), (ii) preparing a fluid mixture of nonionic surfactant component (a) and cationic softener component (b), (iii) spraying said fluid mixture on to a moving bed of said carrier granules, the improvement which comprises:

including in the spray dried carrier granules (i) from about 0.1% to about 5% of an anionic surfactant selected from alkali metal C_9–C_{16} alkyl benzene sulphonates, and C_{12}–C_{20} alkali metal soaps, and maintaining the weight ratio of anionic surfactant to cationic softener (b) less than 1:5, whereby an appropriate product density is secured;

melting components (a) and (b) together and adding to the resulting molten mixture from about 0.3% to about 5.0%, by weight of the composition, of a second discoloration inhibitor selected from the group consisting of C_{10}–C_{20} primary alcohol ethoxylates condensed with from about 17 to about 100 molar proportions of ethylene oxide, polyethylene glycols of molecular weight from about 1000 to about 3000, and mixtures thereof, and spraying the molten mixture on a moving bed of the carrier granules which are maintained at a temperature from about 40° C. to about 75° C. during and for about 0.5 to about 5 minutes after said spraying operation, whereby a free-flowing composition is secured.

4,291,072

METHOD OF PRODUCING AIR-PERMEABLE FABRIC CONDITIONER SHEET FOR LAUNDRY DRYER

John H. Barrett, La Mirada, and Brian P. Flynn, Long Beach, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Division of Ser. No. 840,102, Oct. 6, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,472
Int. Cl.[3] B05D *5/00*
U.S. Cl. 427—243 13 Claims

1. The method of producing a fabric conditioner to be used in a laundry dryer, that includes

(a) treating an air permeable sheet, including distributing a fabric conditioner composition on the surface of said sheet,

(b) said treating including variably displacing said distributed composition on the sheet by application of displacing media thereto thereby providing substantially regularly distributed composition concentrations occluding interior interstitial spaces at certain regions of the sheet interior to block airflow therethrough, and greater air permeability at other sheet interior regions located adjacent to and between said concentrations than at said concentrations, said other regions of the sheet characterized by interstitially open spaces including relatively larger spaces from which conditioner composition has been removed by said variable displacement step, and relatively smaller spaces at which conditioner composition remains.

4,291,073

METHOD FOR FORMING LUBRICATING FILMS

Michael D. Soutsos, 5475 Colorado St., Long Beach, Calif. 90814

Filed Aug. 4, 1980, Ser. No. 175,051
Int. Cl.[3] F16N *15/00*
U.S. Cl. 427—314 2 Claims

1. A method of coating articles with a dry lubricating film comprising the steps of:

heating the article until a surface temperature of 300°-500° F. is achieved thereon;

depositing an emulsion of powdered molybdenum disulfide emulsified in a solution of methylbenzene and paraphenyl phenol formaldehyde; and

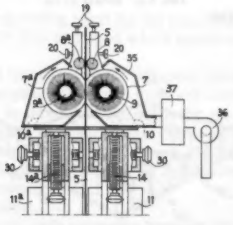
heating the coated article in an oven at a temperature of 300°-500° F. until the solution sets up.

4,291,074

PROCESS FOR PRODUCING A SHEET OR STRIP WHICH IS LIGHTLY GALVANIZED ON ONE OR BOTH SIDES AND PRODUCTS OBTAINED BY SAID PROCESS

Bernard Schoeps, Strasbourg, and Michel Foret, Wantzenau, both of France, assignors to Laminoirs de Strasbourg, Strasbourg, France

Filed Oct. 31, 1979, Ser. No. 89,796
Claims priority, application France, Nov. 9, 1978, 78 31663; Oct. 9, 1979, 79 25090
Int. Cl.[3] C23C *1/02*
U.S. Cl. 427—367 9 Claims



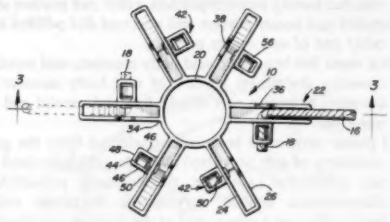
1. In a process for producing a hot galvanized press-formable steel sheet or strip having an extremely light coating on at least one side, comprising continuously passing the sheet or strip in a conventional hot dipping galvanizing bath and scraping or wiping a part of the liquid zinc on the sheet or strip when it issues from the bath; the improvement comprising determining the distance from the surface of the bath of a region of the sheet or strip in which the temperature of the zinc coating on the sheet or strip is in the range in which the zinc passes through a liquid-solid transitory state which is characterized by the friability of the zinc, and exerting in this region a mechanical action on at least one of the sides of the sheet or strip a little after the complete solidification of the zinc so as to completely remove the whole of the non-alloyed zinc and leavy only a thin layer of iron-zinc alloy.

4,291,075

BRACKET FOR ARTIFICIAL CHRISTMAS TREE BRANCHES

Salvatore J. Puleo, 435 Division St., Elizabeth, N.J. 07201

Filed Oct. 29, 1979, Ser. No. 89,562
Int. Cl.[3] A47G *33/06*
U.S. Cl. 428—8 6 Claims



1. A bracket for mounting artificial tree branches to an artificial tree trunk comprising:

an annular member concentrically and fixedly positionable on said tree trunk;

a plurality of outwardly extending arms on said annular member, said arms being circumferentially spaced on said annular member and rigidly mounted thereto, each of said arms defining an upwardly opening channel for receiving an inner end of an artificial tree branch, said channel being defined by first and second parallel spaced vertical walls interconnected by an upwardly and outwardly inclined bottom wall, said first vertical wall including a generally vertical slot communicating with an upper edge thereof and said second vertical wall including an opening generally in alignment with a lower end portion of the slot for receiving a laterally extending portion of said inner end of said tree branch with said slot enabling the tree branch integral with and adjacent to the laterally extending inner end to be moved into the channel and to be supported by the inclined bottom wall of said channel which serves to limit a downward swinging movement of said artificial tree branch;

means on each arm pivotally supporting the inner end of said tree branch to enable the tree branch to pivot about an axis transverse to the trunk; and

means on each arm to limit the downwardly swinging movement of the tree branch so as to position the tree branch in a position which simulates its natural relation to the tree trunk with the tree branch being freely pivotal upwardly to a position alongside the tree trunk.

4,291,076

TRIM MOLDING STRIPS FOR A VEHICLE

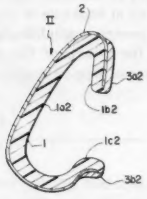
Hisanori Katoh, Tokyo, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 9, 1979, Ser. No. 28,188

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.³ B60R *13/02, 13/04*

U.S. Cl. 428—31 **11 Claims**



1. A trim molding strip for a vehicle comprising:

(a) a synthetic resin body member of a material having a high resistance to deformation selected from the group consisting essentially of acrylonitrile-butadiene-styrene, polycarbonate, poly-phenylene oxide, acrylonitrile-styrene, polypropylene, polyvinyl chloride, or polyamide, said body member having a center portion, a first end portion at one end of said center portion and a second end portion at the other end of said center portion;

(b) a metal foil bonded to said body member, said metal foil covering the center portion of said body member and covering at least a part of said first and second end portions; and

(c) plastic protective layer means selected from the group consisting of soft polyvinyl chloride, ethylene-vinyl acetate copolymer, ionomer, thermoplastic polyurethane, thermoplastic rubber, acrylonitrile butadiene rubber, butyl rubber or a compound of the rubbers and plastic or a foamed one of the rubbers, bonded to said metal foil only on the portions of the metal foil which cover the first and second end portions of said body member, said protective layer means covering at least a portion of the metal foil which covers the part of said first and second end portions of said body member, said protective layer means being soft relative to said body member and adapted for positioning between said metal foil and a vehicle for contacting said vehicle and forming a protective layer between said metal foil and the surface of said vehicle at the first and second end portions of said body member.

4,291,077

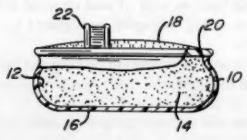
METHOD AND APPARATUS FOR INSTALLING A WHEEL COVER

Robert D. Mundell, 221 Penhurst Dr., Pittsburgh, Pa. 15235

Filed Aug. 8, 1979, Ser. No. 64,671

Int. Cl.³ A41D *13/08*

U.S. Cl. 428—76 **6 Claims**



1. An apparatus to distribute an impact force along a selected surface, comprising:

a semi-rigid stiffener sheet having an exposed surface and an unexposed surface;

a deformable casing secured at its periphery to said stiffener sheet;

said casing and the said unexposed surface of said stiffener sheet defining an enclosure;

finely divided solid material filling said enclosing;

retaining means secured to the said apparatus to retain the said exposed surface against the hand of a user of the apparatus.

4,291,078

BREATHABLE LEATHER-LIKE MATERIALS AND PROCESS FOR MAKING SAME

Harold D. Lyons, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 687,411, May 14, 1976, abandoned, which is a division of Ser. No. 389,023, Aug. 16, 1973, abandoned. This application Mar. 27, 1980, Ser. No. 134,615

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—91 **8 Claims**

1. A leather-like material with a high degree of air permeability, good abrasion resistance and resistance to cracking at low temperatures consisting essentially of a porous, fibrous substrate having fibers extending from a surface thereof, and a polymer layer comprising from about 7 percent to about 15 percent by weight, based upon the substrate and formed of a polymeric composition having a gas entrapped therein, said polymer layer being secured substantially exclusively along said ascending fibers and forming a discontinuous polymer phase and a continuous pore phase wherein the discontinuous polymer phase of said polymer layer covers from about 30 percent to about 70 percent of surface of said material with the remainder being the continuous pore phase, said leather-like material having a surface luster from about −0.7 to about +5.7.

4,291,079

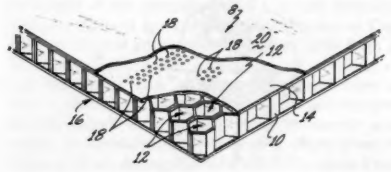
METHOD OF MANUFACTURING A HONEYCOMB NOISE ATTENUATION STRUCTURE AND THE STRUCTURE RESULTING THEREFROM

Felix Hom, La Mesa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 12, 1979, Ser. No. 102,766

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 **8 Claims**



1. A process for manufacturing an improved acoustic sand-

wich panel for attenuating a wide range of noise frequencies which is suitable structurally for use in a severe environment, said sandwich panel including a central cellular core positioned between an imperforate facing sheet and a perforated facing sheet having a plurality of perforations therethrough, the opposite side of the perforated sheet from said central cellular core having a thin layer of porous fibrous material bonded thereto that has a predetermined flow through resistance, the steps of the process comprising:

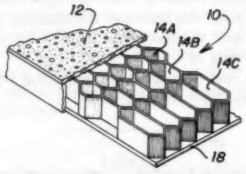
(a) cleaning and degreasing the imperforate sheet, central cellular core, perforate facing sheet and thin layer of porous fibrous material;
(b) applying a layer of a solvent base adhesive to one side of the perforated sheet;
(c) removing the solvent from the layer of solvent base adhesive;
(d) securing together the solvent base coated surface to the perforate sheet and the thin sheet of porous fibrous material under a positive pressure;
(e) curing the solvent base adhesive and removing the positive pressure;
(f) coating the fibers of the thin sheet of porous fibrous material and the perforated sheet surface adjacent thereto with a solution comprising an anti-wetting agent and an indicator;
(g) inspecting the opposite perforated surface of the combined perforated sheet for any trace of the indicator thereon;
(h) removing any indicator with accompanying nonwetting agent from the opposite perforated surface;
(i) applying a layer of a second adhesive between the imperforate sheet and the central cellular core and between the perforation exposed surface of the combined perforated sheet and thin layer of porous fibrous material and the central cellular core;
(j) securing together the imperforate sheet, central cellular core and combined peforate facing sheet and thin sheet of porous fibrous material under a positive pressure; and
(k) curing the second adhesive and removing the positive pressure.

4,291,080

SOUND ATTENUATING STRUCTURAL PANEL

Richard A. Ely, Dallas, and Sherwood W. McClaren, III, Grand Prairie, both of Tex., assignors to Vought Corporation, Dallas, Tex.

Filed Mar. 31, 1980, Ser. No. 135,388
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—116 **21 Claims**



1. A sound-suppressing panel for use on a structure adjacent which a fluid is to flow and upon which sound waves impinge, comprising:

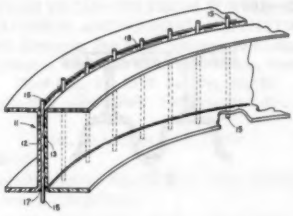
(a) a top sheet forming a cover, adjacent which a fluid flow is adapted to pass and cause a turbulent boundary layer of fluid to be in direct contact with the cover, and there being a plurality of linear passages through the cover, and the separation of adjacent passages being no more than about ten times the diameter of the smaller of any two adjacent passages;
(b) a bottom sheet;
(c) a plurality of walls extending between the bottom sheet and the top sheet, and the walls having various orientations and intersecting one another at various locations so as to form cells, and the walls having different dimensions so as to create at least two differently sized cells, and each cell having a characteristic frequency which is determined by the cell volume and the size and quantity of linear passages leading into a respective cell, and there being combinations of cell and passage sizes so as to produce at least two different characteristic frequencies associated with sound-induced oscillatory flow through the linear passages;
(d) and the cells being arranged in a side-by-side fashion, with differently sized cells being positioned adjacent one another, and the linear passages also being located adjacent each other so as to insure that the localized vortices associated with the sound-induced oscillatory flow through a respective linear passage interacts with the localized oscillatory flow through the adjacent linear passages, whereby the intermixing of vortices generated by adjacent linear passages contributes to an enhanced mixing of said localized vortices with the turbulent boundary layer flow that is passing over said vortices.

4,291,081

LACED COMPOSITE STRUCTURE

Nejat A. Olez, Rancho Palos Verdes, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jul. 26, 1979, Ser. No. 60,896
Int. Cl.³ E04C *3/02*
U.S. Cl. 428—119 **6 Claims**



1. A bonded joint comprising, in combination:

a. at least one skin panel;
b. two upstanding members having abutting surfaces bonded side by side, and flanges which are bonded to said skin panel forming said bonded joint; and
c. lacing, cocured under tension, extending through said panel and between said abutting surfaces of said upstanding members through a plurality of holes provided between said abutting surfaces to transfer tension and shear loads occurring normal to said skin panel into and through said upstanding members.

4,291,082

BREATHABLE FABRIC AND SACK MADE THEREFROM

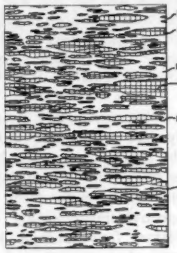
Alan D. Stall, Omemee, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1979, Ser. No. 94,110
Claims priority, application United Kingdom, Nov. 15, 1978, 044572/78
Int. Cl.³ B32B *3/10, 5/20;* B65D *29/02*
U.S. Cl. 428—138 **13 Claims**

1. A breathable fabric comprising a structure woven from synthetic thermoplastic polymeric tapes, said structure having a foamed porous lace-like coating of synthetic thermoplastic polymeric material bonded to at least one side thereof.

9. A process for making a breathable fabric comprising melt extruding a coating of a synthetic thermoplastic polymer onto

and bonding the coating to a woven structure of synthetic polymeric tapes, wherein the coating material contains a blowing agent in an amount sufficient to make the coating into a porous lace-like layer upon extrusion.



4,291,083

SLIDING BARRIER FOR FURNITURE DEVICES AND OPENINGS IN BUILDINGS

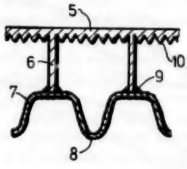
Jens Breitenbach, Haan, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,081

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855652

Int. Cl.³ B32B *3/30*

U.S. Cl. 428—163 **6 Claims**



1. A sliding barrier for furniture, devices and openings in buildings, comprising a flat plastic web provided with narrow plastic reinforcing ribs which extend in a transverse direction to the sliding direction of the barrier, the ribs having ends joined by a resilient plastics film which is preshaped at least partially concavely and/or convexly between adjacent reinforcing ribs.

4,291,084

WARP-FREE MULTI-LAYER STAMPABLE THERMOPLASTIC SHEETS

Leon Segal, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 889,573, Mar. 23, 1978, abandoned. This application Aug. 16, 1979, Ser. No. 67,483

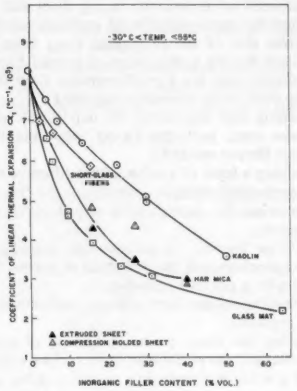
Int. Cl.³ B32B *5/16, 27/04*

U.S. Cl. 428—212 **16 Claims**

1. A warp-free laminated sheet comprised of at least one pair of thermoplastic layers, the total number of said layers being even, wherein each pair of layers is comprised of:

(a) a surface layer consisting essentially of a thermoplastic polymer and about 10 to 75 weight percent, based on the total weight of the surface layer, of mica having an aspect ratio of at least 20 to 1; and

(b) a strength layer adjacent to said surface layer comprised of a thermoplastic polymer and about 10 to 60 weight percent, based on the total weight of the strength layer, of a long glass fiber mat comprised of fibers having a length of at least 1 inch, said mat being substantially encased in a matrix of said thermoplastic, wherein the ratio of the volume percent of said mica in the surface layer to the volume percent of said glass fiber mat in the strength layer is about 1.75 to 2.5.



4,291,085

PACKAGING MATERIAL FOR FOOD TO BE SUBJECTED TO HIGH-TEMPERATURE SHORT-TIME STERILIZATION AND PROCESS FOR THE PREPARATION THEREOF

Senji Ito, Ebina, and Kenji Suzuki, Yokohama, both of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 413,256, Nov. 6, 1973, abandoned. This application May 4, 1976, Ser. No. 682,908

Claims priority, application Japan, Nov. 10, 1972, 47-113388; Jun. 19, 1973, 48-068295

Int. Cl.³ B65D *65/40*

U.S. Cl. 428—215 **18 Claims**

1. A packaging material for food to be subjected to high-temperature short-time sterilization, which comprises a flexible laminate sheet including (a) a heat-sealable inner face layer of a crystalline polypropylene and (b) a heat-resistant resin outer face layer of a thermoplastic resin having a melting point or decomposition point higher than the melting point of said polypropylene, said thermoplastic resin being selected from the group consisting of

(a) polyesters and copolyesters comprising recurring units expressed by the following formula

$$\text{—O—R}_1\text{—O—}\overset{\overset{\text{O}}{\|}}{\text{C}}\text{—R}_2\text{—}\overset{\overset{\text{O}}{\|}}{\text{C}}\text{—} \quad \text{or} \quad \text{—O—R}_1\text{—O—R}_2\text{—}\overset{\overset{\text{O}}{\|}}{\text{C}}\text{—}$$

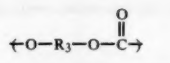
wherein R_1 is an alkylene or cycloalkylene group having 2 to 8 carbon atoms, and R_2 is an arylene group,

(b) polyamides and copolyamides comprising recurring units expressed by the following formula

$$\text{—NH—(CH}_2\text{)}_n\text{—}\overset{\overset{\text{O}}{\|}}{\text{C}}\text{—} \quad \text{or} \quad \text{—NH—(CH}_2\text{)}_n\text{—NH—}\overset{\overset{\text{O}}{\|}}{\text{C}}\text{—(CH}_2\text{)}_m\text{—}\overset{\overset{\text{O}}{\|}}{\text{C}}\text{—}$$

wherein n is a number of 3 to 13 and m is a number of 4 to 11,

(c) polycarbonates comprising recurring units represented by the following formula



wherein R_3 is a hydrocarbon group having 8 to 15 carbon atoms,

(d) biaxially stretched isotactic polypropylene films, and

(e) acetyl cellulose,

said heat-sealable inner face layer of said crystalline polypropylene film being characterized in that (i) said film is one prepared by melting in an extruder a crystalline polypropylene having a melt flow index of 0.5 to 3, extruding the melt in the form of a film at a temperature of 230° to 260° C., through a T die, and contacting the extruded film with a chill roll having a surface temperature of 20° to 70° C., to thereby cool rapidly and solidify the film, (ii) when the film is extracted in salad oil at 130° C. for 30 minutes, the amount extracted of the polypropylene is smaller than 1500 ppm, (iii) the polypropylene film has a pseudohexagonal crystal form or a crystal form of a combination of the pseudohexogonal system and α-monoclinic system and a degree of orientation not higher than 3.0 and (iv) the surface of the polypropylene film confronting the layer (b) has a tension in the wet state (T_1) of at least 38 dyne/cm when it is allowed to stand still in an atmosphere of a temperature of 20° C. and a relative humidity of 40% for 1 week.

4,291,086

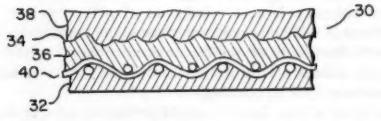
COATING SYSTEM FOR ROOFS, SWIMMING POOLS AND THE LIKE

Jerry P. Auten, Rte. 6, Box 752, Charlotte, N.C. 28204

Continuation-in-part of Ser. No. 39,805, May 17, 1979, Pat. No. 4,212,913. This application Jul. 10, 1980, Ser. No. 168,419

Int. Cl.[3] **B32B** *7/00, 17/04;* **E04D** *5/10*

U.S. Cl. 428—242 **12 Claims**



1. A coating system of high tensile strength and resilience for use as a coating for roofs, swimming pools and the like comprising an underlayer of asphalt material, an intermediate layer of woven fiber glass fabric, a first overlayer of coating material bonded to said underlayer and intermediate layer with said intermediate fiber glass fabric layer embedded between said underlayer and said first overlayer, and a second overlayer of said coating material bonded to said first overlayer, said woven fiber glass fabric including strands of bulked yarn in a relatively loose weave, and said coating material comprising an acrylic resin emulsion.

4,291,087

NON-WOVEN FABRICS BONDED BY RADIATION-CURABLE, HAZARD-FREE BINDERS

Charles E. Warburton, Jr., Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 12, 1979, Ser. No. 47,839

Int. Cl.[3] **B05D** *3/06;* **B32B** *27/04, 27/12, 31/28;* **D04H** *1/58*

U.S. Cl. 428—288 **12 Claims**

1. A process for making a non-woven fabric comprising:

a. providing a mass of fibers associated in a random or regular pattern to form a web or mat, at least 50% by weight of the fibers being hydrophobic;

b. contacting with the fibers a hydrophobic binder, which does not contain conventional polymerizable crosslinking agents or unpolymerized ethylenic unsaturation and which does not contain a photosensitive group or compound, comprising a polymer polymerized from a monomer mixture comprising at least one polymerizable monoethylenically unsaturated monomer selected from the group consisting of C_2–C_{18} alkyl acrylates, C_2–C_{18} alkyl methacrylates, vinyl aromatic compounds, vinyl halides, vinylidene halides, vinyl esters of saturated carboxylic acids, polymerizable ethylenically unsaturated mono-carboxylic and dicarboxylic acids and esters thereof, acrylonitrile, methacrylonitrile, alpha-olefins, and diene monomers, the polymer having a molecular weight of from about 50,000 to 10,000,000 and a glass transition temperature of from about −60° C. to 40° C.;

c. drying the binder-containing mass of fibers at a temperature above the glass transition temperature of the polymer to effect fusion of the polymer and bonding of the mass of fibers thereby; and

d. exposing the dried binder-containing mass of fibers to a source of radiation, wherein the radiation consists of ultraviolet radiation and electron beam radiation, for a period of time sufficient to effect cure of the polymer by crosslinking the polymer chains, thereby rendering the resulting non-woven fabric resistant to organic dry-cleaning solvents and laundering and increasing the wet strength of the resulting non-woven fabric.

10. An article of manufacture produced by the process of claim 1.

4,291,088

FOAM PRODUCTS FROM FURFURYL ALCOHOL-AMINO-FORMALDEHYDE

Per L. Wolff, Birkerod, Denmark, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Aug. 14, 1979, Ser. No. 66,583

Claims priority, application Netherlands, Jul. 10, 1979, 7905380

Int. Cl.[3] **B32B** *5/18, 17/04*

U.S. Cl. 428—313 **8 Claims**

1. A non-inflammable, non-flashing foam product, particularly foam board, comprising:

(a) a layer of a rigid foam product of a furfuryl alcohol-aminoformaldehyde resin composition containing at least a sufficient amount of a boron compound so that the foam will pass the muffle furnace test at 500° C. and has no second exotherm at 200° C.;

(b) at least one surface of said layer of rigid foam product having, as an integral part of its surface layer, a porous glass fibre tissue;

(c) a solid or semi-solid layer of an inorganic material applied subsequently onto the glass fibre tissue containing surface.

4,291,089

COMPOSITE POWDERS SPRAYABLE TO FORM ABRADABLE SEAL COATINGS

Emilija Adamovic, Edmonton, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Nov. 6, 1979, Ser. No. 91,870

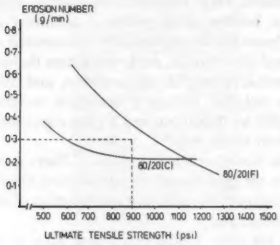
Int. Cl.[3] **B05D** *1/10;* **B32B** *5/16*

U.S. Cl. 428—325 **30 Claims**

1. A composite powder sprayable by thermal spraying onto a substrate to form an abradable seal coating with suitable strength and erosion resistance, said powder comprising particles each having a core of non-metallic solid material surrounded by a layer of metallic material selected from the group consisting of nickel and nickel alloys,

at least about 95% by weight of the particles having a size less than about 150 microns,

at least about 50 to about 90% by weight of the particles having a size greater than about 75 microns; and



less than about 10% by weight of the particles having a size less than about 45 microns.

4,291,090

HEAT SEALABLE PLASTIC FILMS COATED WITH A COATING COMPOSITION

Fujisawa Kenji, 1-3, Honcho 1-Chome, Jyoetsu; Katsube Kazuo, 30; Yako Tadataka, 1100, both of Oaza Arai, Arai; Uemura Koich, 5-1-506, Higashi Izumigaoka 2-chome, Toyonaka; Harada Yuichi, and Sakai Yasumasa, both of 238, Aza Hayashi, Tsugiya, Amagasaki, all of Japan

Continuation-in-part of Ser. No. 948,006, Oct. 2, 1978, abandoned, which is a division of Ser. No. 806,579, Jun. 15, 1977, abandoned. This application Dec. 19, 1978, Ser. No. 971,117

Claims priority, application Japan, Jun. 21, 1976, 51-73498; Dec. 20, 1977, 52-154122

Int. Cl.[3] **B32B** *5/16, 27/08, 27/28*

U.S. Cl. 428—327 **10 Claims**

1. A heat sealable coated plastic film comprising a polyolefin or polyester plastic film substrate coated with a composition, which comprises an aqueous dispersion containing, in substantially particulate form, a copolymer of:

(a) at least one α,β-unsaturated carboxylic acid, in an amount of from 0.1 to 10 percent by weight of the copolymer,

(b) at least one acrylic ester selected from the group consisting of alkyl acrylates whose alkyl group contains one to twelve carbon atoms and alkyl methacrylates whose alkyl group contains one to twelve carbon atoms, and

(c) at least one copolymerizable hydroxyalkyl ester of α,β-unsaturated carboxylic acids, the amount of component (c) being from 0.1 to 80 percent by weight of the copolymer;

said ingredients being incorporated in the copolymer in proportions such that the copolymer has an average molecular weight of from 5,000 to 150,000 a second-order transition temperature of from 30° to 70° C., and comprises particles whose size is primarily from 0.01 to 1.0 micron; and said copolymer being incorporated in the aqueous dispersion in an amount of from 10 to 60 percent by weight thereof.

4,291,091

BUBBLE MEMORY OPTIMIZATION BY ADJUSTING PROPERTIES OF QUARTZ FILM

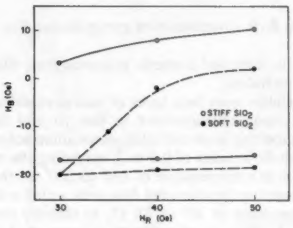
Martin J. Casey, Lansdale; Barry F. Stein, Dresher, and Herman E. Wetterskog, Douglasville, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Division of Ser. No. 839,699, Oct. 5, 1977. This application Jun. 11, 1980, Ser. No. 158,194

Int. Cl.[3] **B32B** *9/04*

U.S. Cl. 428—336 **4 Claims**

1. A bubble memory device comprising a substrate, a magnetic bubble film formed on said substrate, a conductor and a permalloy film the improvement comprising,



a. a quartz layer interposed between said conductor and said bubble film, and between said conductor and said permalloy film, said quartz layer having a stiffness characteristic obtained by a p-etch deposition rate below 6 Å/second.

4,291,092

HEAT SEALABLE PACKAGING FILM COMPRISING PROPYLENE POLYMER SUBSTRATE AND A SURFACE LAYER BLEND OF ETHYLENE COPOLYMER AND PROPYLENE COPOLYMER

Milton L. Weiner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 5, 1979, Ser. No. 82,344

Int. Cl.[3] **B32B** *27/08, 27/32*

U.S. Cl. 428—349 **9 Claims**

1. A multiple-layer, heat-sealable film comprising

(a) a substrate layer consisting essentially of a homopolymer of polypropylene, a copolymer of polypropylene, or a blend of said homopolymer of copolymer containing up to 40% by weight of a different compatible polyolefin; and

(b) on at least one of the surfaces of the substrate layer, a surface layer comprising

a blend of less than 25 weight percent or greater than 90 weight percent of a copolymer of ethylene (1–9.5 mole percent) and a higher olefin having 4 or more carbon atoms (99–90.5 mole percent), and greater than 75 weight percent or less than 10 weight percent of a copolymer of propylene (80–95 mole percent) and a higher olefin having 4 or more carbon atoms (20–5 mole percent).

4,291,093

STABILIZED POLYOLEFIN SUBSTRATE OVERCOATED WITH AN ETHOXYLATED LUBRICANT AND A PHOSPHATE ESTER

Marvin Wishman; Peter A. Taylor, and James C. Leininger, all of Greenville, S.C., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Oct. 5, 1979, Ser. No. 82,390

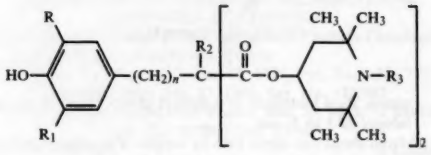
Int. Cl.[3] **B32B** *27/02, 27/06, 27/18, 27/32*

U.S. Cl. 428—379 **24 Claims**

1. Degradation resistant articles of manufacture prepared from

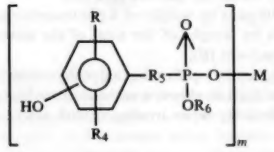
(A) stabilized polymeric compositions comprising a major amount of a polymer of a mono-1-olefin having incorporated therein a small, but effective, stabilizing amount, sufficient to stabilize said composition against the deteriorative action of ultraviolet radiation, of

(1) at least one hindered amine represented by the formula



where R, R^1, R^2 are the same or different, each being an alkyl group having from 1 to about 6 carbon atoms, R^3 is an alkyl group having from 1 to about 12 carbon atoms, and n is an integer of 1 to 4, and

(2) at least one metal phosphonate represented by the formula



where R is as before, R^4 is hydrogen or alkyl having from 1 to about 6 carbon atoms, R^5 is an alkylene radical having from 1 to about 4 carbon atoms, R^6 is hydrogen or alkyl having from 1 to about 30 carbon atoms, M is a metal selected from among aluminum, barium, cadmium, calcium, chromium, cobalt, nickel, sodium, tin, and zinc, and m is an integer of 1, 2 or 3, and

(B) overcoated with a finish composition comprising

(a) at least one ethoxylated textile lubricant in an amount sufficient to impart lubricating properties to said composition, and

(b) an antistatic agent comprising phosphate esters in an amount sufficient to impart antistatic properties to said composition and increase the stability of said articles.

7. An article according to claim 1 which is a filament.

13. A process comprising

(A) forming a shaped article from a stabilized polymeric composition comprising a major amount of a polymer of a mono-1-olefin having incorporated therein a small, but effective, stabilizing amount sufficient to stabilize said composition against the deteriorative action of ultraviolet radiation of

(1) at least one hindered amine and

(2) at least one metal phosphonate, with the further proviso that both (1) and (2) have a structural formula as defined in claim 1, and

(B) applying to the thus-shaped article, a finish coating composition comprising

(a) an ethoxylated textile lubricant in an amount sufficient to impart lubricating properties to said composition and

(b) an antistatic agent comprising phosphate esters in an amount sufficient to impart antistatic properties to said composition and to increase the stability of said shaped articles.

21. A process for preparing a polyolefin textile material comprising

(a) melt spinning a polyolefin resin containing a stabilizing system comprising a hindered amine and a metal phosphonate, each of which has a structural formula as defined in claim 1 and

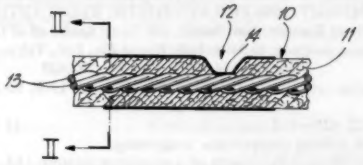
(b) applying to said melt spun polyolefin a finish composition comprising an ethoxylated textile lubricant in a major amount sufficient to impart lubricating properties to said composition and an antistatic agent comprising phosphate esters in a minor amount sufficient to impart antistatic properties to said composition and increase the stability of said melt spun polyolefin textile materials.

4,291,094

PULP INSULATION REPAIR

William P. Trumble, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1979, Ser. No. 89,226
Int. Cl.³ B32B *15/14*; C08K *5/12*
U.S. Cl. 428—380 **8 Claims**



1. A fibreless compound for use as a spray material on pulp insulation consisting essentially of of an electrical conductor comprising from 5.0 to 9.0 parts by weight of polyvinylpyrrolidone-polyvinylacetate copolymer, from 0.5 to 0.9 parts by weight of a copper corrosion inhibitor and from 1.0 to 3.0 parts by weight of a plasticizer.

8. An electrically insulated conductor having at least one conducting member insulated with a covering layer of pulp insulation and the fibers of the pulp having a covering of the compound according to claim 1 which has penetrated between the fibers while substantially avoiding air spaces formed between the fibers.

4,291,095

COATING COMPOSITION FOR GLASS FIBERS

Kenneth P. Chase, Newark, and Dale E. McCoy, Granville, both of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 821,379, Aug. 3, 1977, abandoned. This application Mar. 15, 1979, Ser. No. 20,779
Int. Cl.³ C08L *27/14*; D02G *3/00*
U.S. Cl. 428—391 **9 Claims**

1. A coloring agent-containing coating composition comprising in aqueous dispersion: a film-forming elastomeric latex polymer, an epoxy-functional silane, and a coloring agent comprising an acid-functional latex polymer, a mercapto-functional silane, and a cationic dye.

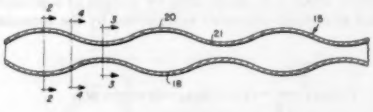
8. A glass fiber substrate at least a portion of the surface of which is coated with a coating of the cured aqueous coating composition of claim 1.

4,291,096

NON-UNIFORM CROSS-SECTIONAL AREA HOLLOW FIBERS

John A. Taylor, Furlong, Pa., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Mar. 12, 1979, Ser. No. 19,972
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—398 **12 Claims**



1. A semipermeable hollow fiber comprising cuprammonium regenerated cellulose, said fiber having a hollow core extending continuously throughout the length thereof and

having a uniform wall thickness and a non-uniform cross-sectional area, said fiber having along its length a first plurality of points of maximum outside diameter and a second plurality of points of minimum outside diameter, said maximum outside diameters ranging from about twenty microns to about one thousand microns and said minimum outside diameters ranging from about 0.25 times the maximum outside diameter to about 0.9 times the maximum outside diameter.

4,291,097

SCRATCH-RESISTANT, DYEABLE COATING COMPOSITIONS FOR SYNTHETIC RESIN ARTICLES

Kazumasa Kamada; Isao Sasaki, and Kenji Kushi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1979, Ser. No. 103,625

Claims priority, application Japan, Dec. 22, 1978, 53-160561

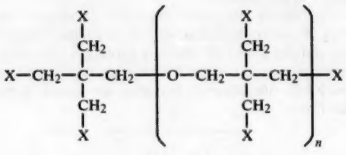
Int. Cl.³ B05D *3/06*

U.S. Cl. 428—412 **21 Claims**

1. A coating composition comprising:

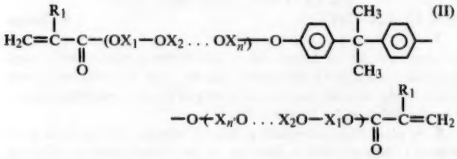
5 to 90 parts by weight of a monomer mixture (A), which monomer mixture consists essentially of:

(1) from about 30 to about 95% by weight of a polyfunctional monomer of a mono or polypentaerythritol poly(-meth)acrylate having at least three (meth)acryloyloxy groups per molecule and represented by the formula:



wherein at least 3 of X are $CH_2{=}CR{-}COO{-}$ groups and the rest are —OH groups, n is an integer of 0 to 4 and R is hydrogen or a methyl group;

(2) up to about 60% by weight of a bifunctional monomer represented by the formula:

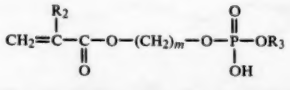


(II)

wherein R_1 is hydrogen or a methyl group, X_1, X_2, $-X_{n'2}$ which may be the same or different, alkylene groups containing at least 6 carbon atoms or of an alkylene-type group containing at most 6 carbon atoms in which one hydrogen atom is replaced with a hydroxyl group, and n'_2 is an integer of 0 to 5;

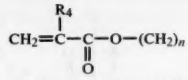
(3) from about 3 to about 40% by weight of a monomer containing not more than 2 (meth)acryloyloxy groups in one molecule, having a boiling point not below 150° C. under atmospheric pressure and a viscosity not higher than 20 centipoises at 20° C.;

(4) from about 1 to about 20% by weight of a phosphoric acid ester-type monomer represented by the formula



(III)

wherein R_2 is hydrogen or a methyl group, R_3 is hydrogen or a



group, R_4 is hydrogen or a methyl group, n and m are an integer of 1 to 5; and

(5) from about 1 to about 10% by weight of an ethanolamine-type compound represented by the formula:

$$NR_5R_6(CH_2CH_2OH) \qquad (IV)$$

wherein each of R_5 and R_6 is independently hydrogen, an alkyl group of 1 to 15 atoms or a CH_2CH_2OH group);

(B) from about 95 to about 10 parts by weight of at least one organic solvent that forms a uniform solution when mixed with said monomer mixture (A); and

(C) up to 10 parts by weight of a photosensitizing agent per 100 parts by weight of the total of the mixture (A) and organic solvent (B);

said coating capable of forming a dyeable cross-linked, hardened film high in abrasion resistance, surface smoothness and antistaticity when irradiated with active energy rays in air.

4,291,098

ORGANOALKOXYSILANE COATING COMPOSITIONS FOR PLASTIC ARTICLES

Mitsuaki Tanaka, and Masaharu Suzuki, both of Kobe, Japan, assignors to Nippon Fine Chemical Co., Ltd. and Nippon Aspherical Lens Co., Ltd., both of Osaka, Japan

Filed Jan. 9, 1980, Ser. No. 110,744

Claims priority, application Japan, Jan. 22, 1979, 54-6654

Int. Cl.³ B32B *27/36;* **B05D** *3/02;* **C09D** *3/82*

U.S. Cl. 428—412 **14 Claims**

14. A plastics article having a cured coating of a composition comprising

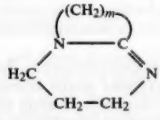
(A) 100 parts by weight of hydrolyzed product of an organoalkoxysilane represented by the formula

$$R^1{}_nSi(OR^2)_{4-n} \qquad (I)$$

wherein R^1 is a saturated or unsaturated hydrocarbon residue having 1 to 4 carbon atoms, R^2 is a saturated hydrocarbon residue having 1 to 4 carbon atoms, and n is 0, 1 or 2,

(B) about 1 to about 10 parts by weight of an epoxy resin having an epoxy equivalent of about 120 to about 700, and

(C) about 0.05 to about 5 parts by weight of a bicyclic amidine represented by the formula



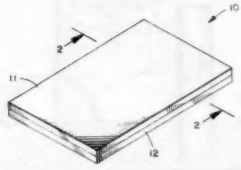
(II)

wherein m is 3 or 5, or a salt thereof.

4,291,099
POLYVINYLIDENE FLUORIDE-POLYURETHANE LAMINATES AND METHOD

Albert Strassel, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Division of Ser. No. 3,633, Jan. 15, 1979, Pat. No. 4,221,757.
This application Jan. 17, 1980, Ser. No. 112,957
Claims priority, application France, Jan. 20, 1978, 78 01590
Int. Cl.[3] B32B *27/00, 31/00*
U.S. Cl. 428—421 4 Claims



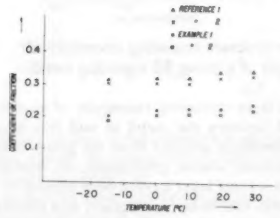
1. A laminate comprising a layer of a polyvinylidene fluoride resin having adhered to at least one surface thereof without any intermediate bonding agent, a layer of a thermoplastic polyurethane resin, said laminate being formed by bringing into contact at least one fluid stream of each of said resins while said stream of a polyvinylidene fluoride has, at 200° C., an apparent viscosity, in poises, between the minimum and maximum values set forth below for at least two of the velocity gradients, in sec^{-1}, set forth below:

VELOCITY GRADIENT	APPARENT VISCOSITY VALUES	
	Minimum	Maximum
3.54	30×10^3	200×10^3
11.81	18×10^3	93×10^3
35.4	11×10^3	47×10^3
118	6.5×10^3	21×10^3
354	3.9×10^3	10×10^3
1181	2.3×10^3	4.5×10^3

4,291,100
MAGNETIC RECORDING MEDIUM

Eiji Horigome; Hiroshi Ota, and Hitoshi Azegami, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,573
Claims priority, application Japan, Jun. 23, 1979, 54/79296
Int. Cl.[3] H01F *10/02*
U.S. Cl. 428—424.2 6 Claims



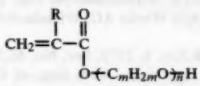
1. A magnetic recording medium which comprises a substrate coated with a magnetic layer wherein a magnetic powder is oriented in a binder and a polyoxyethylenesorbitane higher fatty acid ester surfactant.

4,291,101
WOOD FIBROUS MATERIAL AND A METHOD FOR IMPROVING THE QUALITIES THEREOF

Yoshiharu Tanizaki; Kenichiro Minagawa, both of Yokohama; Shinichi Akimoto, Machida, and Kuninori Horioka, Tokyo, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1979, Ser. No. 64,314
Claims priority, application Japan, Aug. 11, 1978, 53-97399
Int. Cl.[3] B32B *23/08, 27/10;* B05D *3/00, 3/02*
U.S. Cl. 428—514 6 Claims

1. Wood fiber material impregnated with a polymer made of one or more monomers having the formula



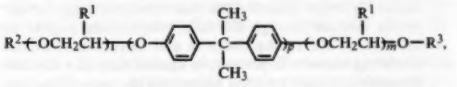
wherein R is hydrogen or methyl, m is an integer of from 2 to 4 and n is an integer of from 2 to 20.

4,291,102
DESENSITIZER FOR NO-CARBON COPY PAPER

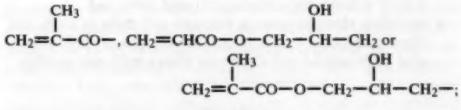
Hirokazu Tsukahara; Mitsuru Fuchigami, and Nobuhiro Kagota, all of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 863,951, Dec. 23, 1977. This application Dec. 13, 1979, Ser. No. 103,564
Claims priority, application Japan, Jan. 17, 1977, 52-3826; Feb. 2, 1977, 52-10543
Int. Cl.[3] B32B *21/06*
U.S. Cl. 428—537 7 Claims

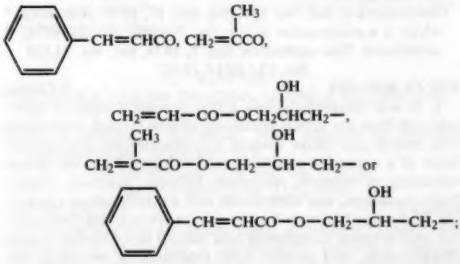
1. No-carbon paper containing a pigment and a desensitizer which is a compound represented by the formula



wherein R^1 represents a hydrogen atom or methyl group; R^2 represents hydrogen atom, a methyl group, a phenyl group which may have as substituent an alkyl group having 1 to 12 carbon atoms, CH_2=CHCO—,

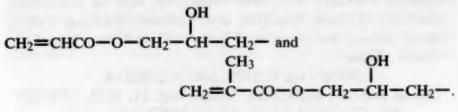


R^3 represents CH_2=CHCO—;



l and m are 1 or integers greater than 1, l+m being not greater

than 46; and p is zero or an integer of 1, provided that when p is zero R^2 is the groups other than



4,291,103

ASSEMBLY OF THIN-WALLED PLATES

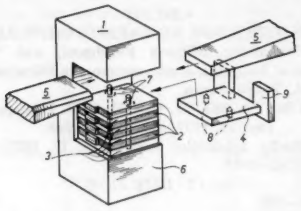
Karl-Heinz Fischbeck, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jun. 5, 1979, Ser. No. 45,734

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1978, 2824539

Int. Cl.[3] **B32B** *3/24, 7/08;* **B21D** *28/26*

U.S. Cl. 428—589 **10 Claims**



1. An assembly comprising:

a stack of thin-walled plates each provided with at least one reamed hole for mounting the plate on a centering element which extends through the hole, wherein the largest dimension of the reamed hole in one direction, when no centering element is present, is smaller than the smallest dimension of the centering element in the same direction, each said plate being further provided with two elongate perforations located adjacent, and at opposite sides of, said hole, said perforations being spaced from the edge of said hole to define plate portions in the form of bars between said perforations and said hole, and said bars being displaceable into the region of said perforations upon insertion of a centering element into said hole; and

a centering element passing through said hole in each said plate to displace said bars into the regions of their associated perforations and align said plates with one another.

4,291,104

BRAZED CORROSION RESISTANT LINED EQUIPMENT

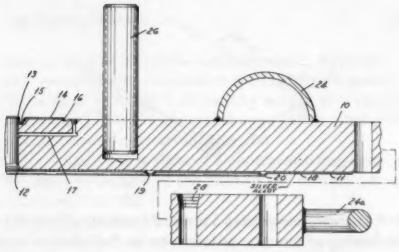
Hibbard G. Keifert, Torrance, Calif., assignor to Fansteel Inc., N. Chicago, Ill.

Continuation of Ser. No. 897,756, Apr. 17, 1978, abandoned, which is a continuation of Ser. No. 708,060, Jul. 25, 1976, abandoned. This application Sep. 7, 1979, Ser. No. 73,326

Int. Cl.[3] **B01J** *19/02*

U.S. Cl. 428—594 **9 Claims**

1. A wall assembly having a first structural layer of metal selected from the group consisting of iron, nickel, and cobalt base metals and alloys thereof, a comparatively thin second layer of a corrosion resistant metal selected from the group consisting of titanium, zirconium, hafnium, tantalum, columbium, vanadium, and fabricatable and weldable alloys thereof, and said second layer at least in part overlying said first layer, the improvement comprising said second layer having a hole therethrough, said second layer extending in the range between said hole and the end of said flange at least ten inches outwardly beyond the entire periphery of said hole, at least a portion of one face of said second layer being united by a brazing alloy to a face of an adjacent portion of said first layer essentially throughout an area within said range and extending at least ten inches outwardly beyond the entire periphery of said hole, said second layer having at least one convolution encircling said hole and in said portion of said second layer having said one face brazed to said face of said adjacent portion of said first layer, said second layer being brazed to said first layer immediately adjacent both sides of said convolution,



and said hole and said convolution being present in said second layer prior to the brazing of said one face of said second layer to said face of said adjacent portion of said first layer such that said second layer, when brazed to said first layer, remains united to said first layer without wrinkling, buckling, puckering, or separating of said second layer, both when said wall assembly is initially cooled after brazing from its brazing temperature to an ambient temperature and if subsequently raised to an elevated temperature of about 200° C.

4,291,105

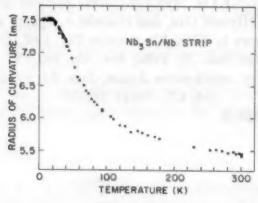
BIMETALLIC STRIP FOR LOW TEMPERATURE USE

Jean F. Bussiere, Yaphank; David O. Welch, Poquott, and Masaki Suenaga, Bellport, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 7, 1979, Ser. No. 64,595

Int. Cl.[3] **B32B** *15/04*

U.S. Cl. 428—616 **4 Claims**



1. A bi-layer structure consisting essentially of:

(a) a first layer of a group 5B transition metal;

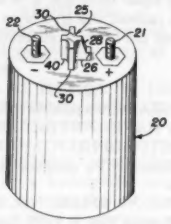
and,

(b) a second layer consisting essentially of an intermetallic compound between the metal of said first layer, and a metal or metalloid selected from the group consisting of gallium, indium, silicon, germanium, tin, arsenic or antimony, said second layer having been bonded to said first layer to form said bi-layer structure, said structure defining a plane, and said structure having been subjected to compressive stresses essentially in the plane of said structure, said stresses having been chosen to cause plastic deformation of said first layer without causing such deformation of said second layer, whereby said structure assumes a curved shape upon removal of said compressive stresses.

4,291,106
BATTERY LINKAGE SYSTEM

John W. Hooke, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed May 27, 1980, Ser. No. 153,760
Int. Cl.[3] H01M 2/20
U.S. Cl. 429—1 18 Claims



1. A system for joining a plurality of electrochemical cells comprising:

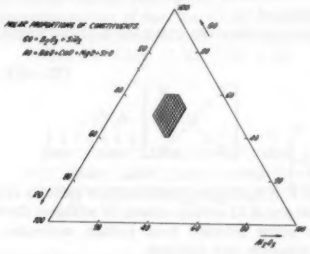
keying means disposed in each of said cells among the terminals thereof; and

link means for electrically coupling a terminal of one of said cells with a terminal of a second of said cells, the arrangement of said keying means and said terminals in each of said cells providing for a mating of one end of said link means with a predesignated terminal in one of said cells.

4,291,107
GLASS SEALS FOR SEALING BETA-ALUMINA IN ELECTRO-CHEMICAL CELLS OR OTHER ENERGY CONVERSION DEVICES, GLASSES FOR USE IN SUCH SEALS AND CELLS OR OTHER ENERGY CONVERSION DEVICES WITH SUCH SEALS

Thomas I. Barry, Hampton Hill; Gary S. Schajer, London, and Francis M. Stackpool, Frodsham, all of England, assignors to Chloride Silent Power Limited, London, England

Filed Apr. 15, 1980, Ser. No. 140,633
Claims priority, application United Kingdom, Apr. 19, 1979, 13668/79
Int. Cl.[3] H01M 10/39
U.S. Cl. 429—104 20 Claims



1. A glass for sealing to beta-alumina in an electro-chemical cell or other energy conversion device containing sodium, said glass consisting essentially of:

(a) 40–60 mol % glass former consisting of 28–48 mol % B_2O_3 and 0–20 mol % SiO_2

(b) 16–28 mol % Al_2O_3

(c) 18–33 mol % of at least one alkaline earth oxide selected from the group consisting of BaO, CaO, MgO and SrO, where the proportions of the constituents furthermore are such that:

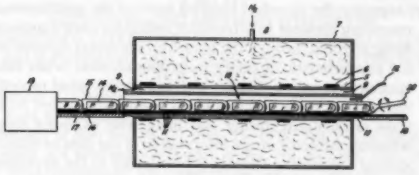
$$0.0517\,A_1+0.0354\,A_2-0.0063\,A_3+0.168\,A_4+0.1336\,A_5+0.098\,A_6+0.1597\,A_7$$

lies between 5.7 and 6.4, where A_1, A_2, A_3, A_4, A_5, A_6 and A_7 are the respective molar percentages of B_2O_3, SiO_2, Al_2O_3, BaO, CaO, MgO and SrO.

4,291,108
PRODUCTION OF β-ALUMINA CERAMIC TUBES

Vincent J. DeCarlo, Clifton Park; Robert W. Powers, Schenectady, and Stephan P. Mitoff, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 25, 1980, Ser. No. 180,601
Int. Cl.[3] H01M 2/00; F27D 3/00
U.S. Cl. 429—193 20 Claims



1. A method for producing a sintered polycrystalline ceramic hollow cylindrical tube open at least on one end without significant out-of-roundness which comprises shaping ceramic powder into a hollow green cylindrical tube, providing a cylindrical sagger open at least on one end and having an inner volume at least sufficient to accommodate said green tube substantially horizontally and allow said tube to rotate therein, disposing said green tube substantially horizontally within said sagger, providing a substantially horizontally disposed open-ended firing tube containing a sintering zone, positioning a layer of friction-reducing spheres on the surface of the lower portion of said horizontally-disposed firing tube along the length thereof, providing said firing tube with an atmosphere which has no significant deleterious effect on said tube being sintered, heating said sintering zone to sintering temperature, passing said tube-containing sagger through said firing tube on said spheres, continuously and simultaneously advancing and alternately rotating said tube-containing sagger through said firing tube so that all portions of said tube therewithin are subjected to at least substantially the same gravitational effect, said advancement and alternate rotation having no significant deleterious effect on said tube therewithin, one completed alternate rotation being comprised of a rotation and a counter-rotation in predetermined amounts, the angles of all said rotations being substantially equal, the angles of all said counter-rotations being substantially equal, the rate of said alternate rotation being at least sufficient to make at least one completed alternate rotation of said tube within said sagger in an advancing distance equivalent to the outer circumference of said tube within said sagger, said tube-containing sagger being advanced through said sintering zone at a rate at least sufficient to sinter said tube therewithin.

4,291,109
ADDITIVE COLOR IMAGING USING A SILVERLESS RECORDING ELEMENT

Keith E. Whitmore, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 26, 1979, Ser. No. 97,254
Int. Cl.[3] G03C 7/04, 5/18, 5/00
U.S. Cl. 430—42 5 Claims

1. A method for producing color transparent images of a multicolored object on a multilayered recording element which includes an additive color screen and a silverless imaging layer, such imaging layer being substantially insensitive and

transparent to visible radiation and responsive to ultraviolet radiation incident thereon to become less transparent to visible radiation, said method comprising the steps of:

(a) forming a monochrome image containing color information of the multicolored object on a panchromatic auxiliary recording element that is separate from said multilayered recording element and is substantially transparent to ultraviolet radiation in a pattern corresponding to image information, said image-forming procedure comprising the steps of illuminating the multicolored object with visible radiation and imagewise exposing the auxiliary recording element to the illuminated object, said imagewise exposure being effected through the multilayered recording element while the relative positions of the auxiliary and multilayered recording elements are substantially fixed; and

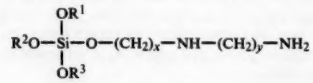
(b) exposing the silverless imaging layer of the multilayered recording element to ultraviolet radiation, such exposure being effected through the monochrome image formed on the panchromatic auxiliary recording element while said auxiliary recording element and said multilayered recording element occupy substantially the same relative positions as occupied during said imagewise exposing step, whereby the color image information in the panchromatic auxiliary recording element is transferred to the silverless imaging layer of the multilayered recording element.

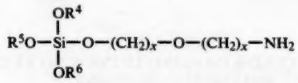
4,291,110
SILOXANE HOLE TRAPPING LAYER FOR OVERCOATED PHOTORECEPTORS

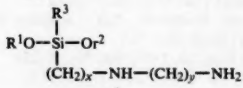
Lieng-Huang Lee, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

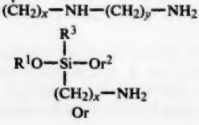
Filed Jun. 11, 1979, Ser. No. 47,461
Int. Cl.³ G03G *5/14, 5/10*
U.S. Cl. 430—59 **8 Claims**

1. A layered photosensitive imaging member which comprises from the bottom up (a) a support substrate; (b) a layer of electrode material capable of injecting holes into a layer on its surface, this layer being comprised of materials selected from the group consisting of graphite, carbon, carbon dispersed in a polymer, or gold; (c) a hole transport layer in operative contact with the layer of hole injecting material which transport layer comprises a combination of a highly insulating organic polymer having dispersed therein small molecules of an electrically active material, the combination of which is substantially non-absorbing to visible light but allows injection of photogenerated holes from a charge generator in contact with the hole transport layer, and electrically induced holes from the layer of the injecting electrode material, (d) a layer of photocharge generating material on and in operative contact with the charge transport layer; (e) a hole trapping layer comprised of nitrogen-containing siloxanes or nitrogen-containing titanium compounds of the formulas


I.


II.


III.


IV.

-continued

$$(R^1O)_m—Ti[O—Z—R^2NH_2]_n \qquad V.$$

wherein R^1, R^2, R^3, R^4, R^5, and R^6 which may be the same or different radicals, are selected from aliphatic, substituted aliphatic, aromatic, and substituted aromatic, x and y are numbers from 2 to about 10, m and n are numbers of from 1 to 3, the sum of m and n being equal to 4, and Z is sulfonyl ($—SO_2$) or a carboxyl ($—CO_2$) radical, and (f) a layer of insulating organic polymer overlaying the layer of generating material.

4,291,111
NITROGEN-CONTAINING ADDITIVES FOR MAGNETIC TONERS HAVING HYDROPHOBIC AND HYDROPHILIC MOIETY

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 854,861, Nov. 25, 1977, abandoned.
This application Feb. 9, 1979, Ser. No. 11,621
Int. Cl.³ G03G *9/00, 9/08*
U.S. Cl. 430—107 **6 Claims**

1. A single component field dependent toner that has a resistivity of 10^{13} ohm/cm to 10^{18} ohm/cm, and thus is conductive at high fields of up to 1,000 volts/cm, thereby allowing substantially complete transfer of the toner when said toner is utilized in an electrophotographic imaging system, this toner being comprised of a resin, a magnetic pigment, and between about 0.5 to about 10 weight percent of a nitrogen containing compound comprising at least one hydrophobic moiety and one hydrophilic moiety, the nitrogen containing compound being dimethyl dihydrogenated tallow ammonium chloride, tallow trimethylene diamine dioleate, distearyl dimethyl ammonium chloride, or stearylimidazoline.

4,291,112
MODIFICATION OF PIGMENT CHARGE CHARACTERISTICS

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

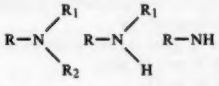
Filed Sep. 11, 1978, Ser. No. 941,539
Int. Cl.³ G03G *9/10*
U.S. Cl. 430—110 **21 Claims**

1. A positively charged dry electrophotographic developer composition comprised of a resin, a carrier, and as a pigment carbon black precoated with a nitrogen containing compound, the nitrogen containing compound being selected from the group consisting of

(a) quaternary ammonium compounds of the formula:

wherein R is hydrogen, hydrocarbon radicals containing from 1 to about 22 carbon atoms, or mixtures thereof, and A is an anion selected from sulfate, sulfonate, nitrate, borate, chlorate, and halogen;

(b) primary, secondary, or tertiary amines of the formula:



wherein R is an aliphatic radical containing from about 8 to about 22 carbon atoms, and R_1 and R_2 are hydrocarbon radicals containing from 1 to about 22 carbon atoms; and

(c) an alkyl pyridinium compound, whereby the coated carbon black pigment is positively charged.

9. A method of imaging comprising forming an electrostatic latent image on a photoreceptor contacting the image with the compositions of claim 1 and subsequently transferring the developed image to a permanent substrate and permanently affixing the image thereto.

4,291,113
METHOD FOR DISPERSING PHOTOGRAPHIC ADDITIVES

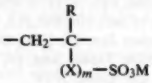
Junji Minamizono; Masakazu Yoneyama, and Jun Sasaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 21, 1980, Ser. No. 123,311
Claims priority, application Japan, Feb. 22, 1979, 54/20133
Int. Cl.³ G03C 1/72
U.S. Cl. 430—202 **22 Claims**

1. A method for dispersing an oil-soluble photographic additive into water or a hydrophilic colloid composition wherein an oil-soluble photographic additive is dispersed in water or a hydrophilic colloid composition in the presence of a polymer having a recurring unit represented by the following general formula (I):

$$-(A)_x-o-(B)_y- \quad (I)$$

wherein A represents a monomer unit of the formula (II):



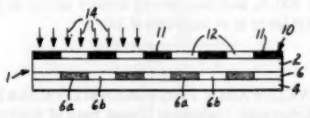
(II)

wherein R represents a hydrogen atom or a methyl group; m represents 0 or 1; M represents a cation; and X represents an alkylene group having 1 to 4 carbon atoms, an arylene group, an aralkylene group having 7 to 11 carbon atoms or a —CO—NH—Y— group where Y is an alkylene group having 1 to 6 carbon atoms or a phenylene group; B represents a copolymerizable ethylenically unsaturated monomer; x is about 10 to 100 mol%; and y is about 0 to 90 mol%.

4,291,114
IMAGEABLE, COMPOSITE-DRY TRANSFER SHEET AND PROCESS OF USING SAME

William R. Berggren, Woodbury, and Shelby J. Brownley, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation-in-part of Ser. No. 67,322, Oct. 18, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 158,951
Int. Cl.³ G03C 11/12, 1/78, 1/68
U.S. Cl. 430—253 **31 Claims**



1. An imageable composite dry-transfer sheet that comprises (a) a cover sheet that is transmissive to activating radiation and has at least one oleophilic surface, (b) a photopolymerizable layer on the oleophilic surface of said cover sheet that comprises a cationically polymerizable organic material, and from about 0.1 to 10 parts by weight per 100 parts by weight of said organic material of a cationic photopolymerization initiator, and (c) a base sheet that has an oleophobic surface in contact with said photopolymerizable layer;

wherein said photopolymerizable layer has a complex shear modulus of, at most, 1×10^6 dyne/cm^2; and

wherein, after image-wise exposure to activating radiation, the interfacial adhesion of the unexposed areas of said photopolymerizable layer is greater for said cover sheet than for said base sheet; the interfacial adhesion of the exposed areas of said photopolymerizable layer is greater for said base sheet than for said cover sheet; and

wherein, after separation of said cover and said base sheets, the unexposed areas of said layer are rendered burnishable by subsequent exposure to activating radiation through said cover sheet.

4,291,115
ELEMENTS AND METHOD WHICH USE PHOTOPOLYMERIZABLE COMPOSITIONS BASED ON SALT-FORMING POLYMERS AND POLYHYDROXY POLYETHERS

William J. Chambers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

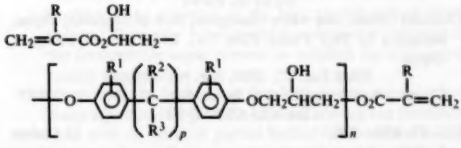
Division of Ser. No. 76,621, Sep. 18, 1979, Pat. No. 4,245,031, which is a continuation-in-part of Ser. No. 892,296, Mar. 31, 1978, abandoned. This application Sep. 17, 1980, Ser. No. 188,223
Int. Cl.³ G03C 1/68, 5/90
U.S. Cl. 430—271 **13 Claims**

1. A photopolymerizable element which comprises a substrate coated with a layer of a photopolymerizable composition comprising 0 to 70% by weight of components which do not contribute to the photoactivity of the composition and 30 to 100% by weight of photoactive system components consisting essentially of

(1) polymer having a number average molecular weight of at least 500, at least two-salt forming groups selected from the group consisting of carboxylic acid groups and amine groups per polymer molecule, and at least 0.025 equivalent of salt-forming group per 1000 grams of polymer;

(2) addition-polymerizable, nongaseous, ethylenically unsaturated compound having at least one complementary salt-forming group selected from the group consisting of carboxylic acid groups and amine groups and being capable of forming a polymer by free-radical initiated, chain-propagating addition polymerization; the ratio of equivalents of complementary salt-forming groups in compound (2) to equivalents of salt-forming groups in polymer (1) being 1:2 to 50:1;

(3) ethylenically unsaturated diester polyhydroxy polyether of the formula



wherein R is H or CH_3; R^1 is H or an alkyl group of 1–4 carbon atoms; n is 1–15; p is 0 or 1; and when p is 1, R^2 is H or CH_3 and R^3 is H, CH_3 or C_2H_5; the amount of polyether (3) being 10 to 75% by weight of the combined total of components (1), (2) and (3); and

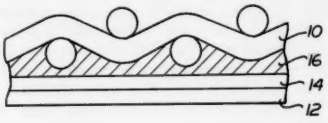
(4) 1 to 20% by weight, based on the total photopolymerizable composition, of a free-radical generating system, activatable by actinic radiation, which initiates polymerization of the unsaturated compounds;

said layer having a thickness in the range from a coating weight of 1 mg/dm^2 to 5 mils in thickness.

4,291,116
METHOD OF IMAGE REPRODUCTION AND MATERIALS THEREFOR

Charles C. Tibbetts, 800 Inverness Dr., Flintridge, Calif. 91101

Continuation-in-part of Ser. No. 846,325, Oct. 28, 1977, abandoned. This application Jul. 19, 1979, Ser. No. 58,816
Int. Cl.³ G03C 5/00
U.S. Cl. 430—308 **28 Claims**



1. The method of reproducing a screen stencil image from an image on a transparent member for printing and like purposes comprising the steps of:

filling the interstices of the screen and substantially covering both sides of the screen with spreadable uncured radiation curable material comprising an acidic constituent;

placing the transparent member on one side of the screen in direct facing contact with the spreadable material;

exposing the material through the transparent member to a radiation source for a time sufficient to at least partially cure and harden the material in the pattern of the image such that where cured the material hardens about the screen;

again spreading a layer of the material on the side of the screen opposite the transparent member, to a depth greater than is desired for the final stencil;

exposing the material to the radiation source through the transparent member for a second time sufficient to cure the material to a depth greater than the screen thickness but less than the total depth of the material;

removing the transparent member from the cured layer;

removing uncured material from the screen to leave open screen areas through which a printing medium may pass; and

removing the stencil from the screen with immersion in an alkaline solution.

4,291,117
PLATE MAKING PROCESS WITH NOVEL USE OF SURFACTANT

Chikashi Ohishi, and Akira Hasegawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 27, 1980, Ser. No. 125,056
Claims priority, application Japan, Feb. 27, 1979, 54/22297
Int. Cl.³ G03C 7/08
U.S. Cl. 430—309 **14 Claims**

1. In a plate-making process comprising the steps of (a) imagewise exposing a presensitized plate comprising an aluminum support having thereon a light-sensitive layer, (b) developing said imagewise exposed presensitized plate to remove either the exposed area or the unexposed area of said light-sensitive layer to reveal the surface of said aluminum support and (c) subjecting said developed plate without conducting water washing to a process selected from the group consisting of (i) application of a developing ink, (ii) retouching process and (iii) gumming process, the improvement which comprises processing the developed plate with an aqueous solution consisting essentially of a surfactant between step (b) and (c).

4,291,118
RELIEF IMAGING LIQUIDS

Paul Boduch, Arlington, and Robert Trasavage, Mashpee, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 106,816
Int. Cl.³ G03C 5/00
U.S. Cl. 430—313 **14 Claims**

1. A method of relief imaging a liquid polymeric composition comprising forming said liquid polymeric composition into a liquid mass, exposing said liquid mass to a first polymerizing actinic radiation chemical hardening treatment sufficient to solidify said liquid mass, thereafter further treating said solidified mass with polymerizing actinic radiation in a pattern and differentiating the chemical condition of said solidified mass in said pattern from the chemical condition of said solidified mass not in said pattern and thereafter selectively removing the portion of said solidified mass subjected to only said first polymerizing actinic radiation leaving that portion of said solidified mass subjected to said further polymerizing actinic radiation as a relief image.

4,291,119
RECORDING MATERIAL

Keishiro Kido; Satoshi Yoshida, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 875,066, Feb. 3, 1978, Pat. No. 4,188,214, which is a continuation of Ser. No. 695,212, Jun. 11, 1976, abandoned. This application Jan. 23, 1980, Ser. No. 114,457
Claims priority, application Japan, Aug. 11, 1975, 50-97251
Int. Cl.³ G03C 5/24
U.S. Cl. 430—348 **11 Claims**

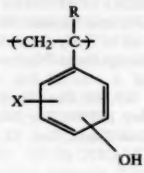
1. A material for recording a high temperature energy source scanned imagewise by evaporating or thermally deforming the scanned portions by melting of at least one recording layer thereof by the heat energy of said high temperature energy source, which comprises a support and at least one recording layer, said at least one recording layer containing at least one distinct metal layer comprising at least one metal selected from the group consisting of Sn, Bi, In, Zn, Al and Cu and said recording layer also comprising at least one distinct compound layer comprising at least one compound selected from the group consisting of CrS, Cr_2S, Cr_2S_3, MoS_2, MnS, FeS, FeS_2, CoS, Co_2S_3, NiS, Ni_2S, PdS, Cu_2S, Ag_2S, ZnS, In_2S_3, In_2S_2, GeS_X, wherein x is a positive integer of 2 to 9, SnS, SnS_2, PbS, As_2S_3, Sb_2S_3, Bi_2S_3, MgF_2, CaF_2, RhF_3, MoO, In_2O, In_2O_3, GeO, and PbO, and at least one layer which contains one or more of said metals in combination with one or more of said compounds and wherein the total thickness of all metal layers present is from about 300 to about 1,500 A, the total thickness of all compound layers present is from about 10 to about 200 A, and the optical density of the at least one distinct metal layer is at least about 2.0.

4,291,120
HEAT DEVELOPABLE PHOTOSENSITIVE MATERIAL

Tomoyuki Kobayashi; Toshimasa Usami, both of Asaka; Hiroshi Misu, and Hidefumi Sera, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 15, 1980, Ser. No. 121,855
Claims priority, application Japan, Feb. 15, 1979, 54-16341
Int. Cl.³ G03C 1/02
U.S. Cl. 430—531 **12 Claims**

1. A heat developable photosensitive material having two or more polymeric binder layers superposed on a support and containing at least (a) an organic silver salt, (b) a photocatalyst and (c) a reducing agent in one or more said layers, at least one of said layers containing as an additive, in an amount sufficient to improve contact between said layers, (d) a polymer having about 5 to 200 repeating units of the formula:



(A)

wherein R is a hydrogen atom or a lower alkyl group; and X is a hydrogen atom, or one to three groups selected from the class consisting of a halogen atom, a nitro group, a cyano group, an alkyl group, an alkoxy group, an alkoxycarbonyl group, an alkylsulfonyl group, an aryloxy group, an acyl group, an acyloxy group and an acylamido group.

4,291,121

BILIRUBIN-RESISTANT DETERMINATION OF URIC ACID AND CHOLESTEROL

Giancarlo Acquati, Robbiate; Giovanni Berti, Malgrate, and Piero Fossati, Lissone, all of Italy, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 29,670, Apr. 13, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,533

Int. Cl.³ G01N *33/52, 33/92, 33/72*

U.S. Cl. 435—10 **17 Claims**

1. Composition for the determination of an analyte selected from uric acid and cholesterol in a fluid sample of the type comprising means responsive to the presence of said analyte in said sample, a phenol or napthol and 4-aminophenazone wherein the improvement comprises reagent means comprising a ferrocyanide ion.

4,291,122

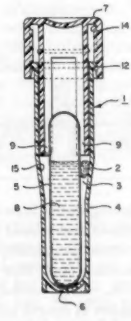
BIOLOGICAL INDICATOR FOR STERILIZATION PROCESSES

Paula A. Orelski, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Aug. 14, 1980, Ser. No. 178,096

Int. Cl.³ C12Q *1/22*

U.S. Cl. 435—31 **19 Claims**



1. A unitary sterilization indicator consisting of a transparent vial containing

fermentable microorganism accessible to and subject to sterilization to substantially the equivalent degree as those objects being sterilized, and a carbohydrate in discrete solid dry form unavailable for metabolism by said microorganism prior to the dissolving of said carbohydrate; and

an inner frangible ampul contained within the said vial and containing a liquid carbohydrate-free growth medium and pH color indicator, whereby

upon completion of a sterilization cycle in which the said unitary indicator is contained within the sterilizer and removal of the indicator therefrom, the frangible ampul is broken and the said liquid medium and pH indicator are released into dissolving contact with the carbohydrate and the so-formed solution into contact with surviving said microorganism.

4,291,123

PRODUCTION OF FRUCTOSE AND FRUCTOSE-BASE SYRUPS AND MEANS FOR CARRYING OUT SUCH PRODUCTION

Ludwig Degen; Paolo Branduzzi; Roberto Olivieri, and Nadia Cimini, all of Rome, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Jun. 8, 1978, Ser. No. 913,536

Claims priority, application Italy, Jul. 5, 1977, 25380 A/77

Int. Cl.³ C12P *19/24*

U.S. Cl. 435—94 **1 Claim**

1. A method for the production of fructose and syrups containing fructose and glucose, said method comprising contacting a solution of glucose with a Streptomyces sp. NRRL 11,120 or NRRL 11,121 or with enzyme originated thereby.

4,291,124

PROCESS FOR THE ACID HYDROLYSIS OF CARBOHYDRATE POLYMERS AND THE CONTINUOUS FERMENTATION OF THE SUGARS OBTAINED THEREFROM TO PROVIDE ETHANOL

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Continuation-in-part of Ser. No. 52,038, Jun. 25, 1979, Pat. No. 4,242,455. This application Mar. 12, 1980, Ser. No. 129,518

Int. Cl.³ C12P *7/14*

U.S. Cl. 435—162 **19 Claims**

1. A process for the acid hydrolysis of carbohydrate polymer and the continuous fermentation of the fermentable sugars therefrom to provide ethanol which comprises:

(a) substantially uniformly mixing a pressurized acidified aqueous slurry of carbohydrate polymer particles with relatively high pressure stream;

(b) passing the acidified carbohydrate polymer slurry through a conduit under substantially steady state temperature and pressure for a period sufficient to convert at least about 60% by weight of the carbohydrate polymer to fermentable sugar but without appreciable conversion of carbohydrate polymer to non-fermentable products;

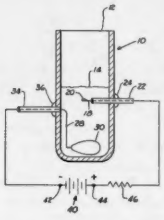
(c) reducing the pressure of the hydrolyzed carbohydrate polymer slurry to a level at which undesirable reactions of the fermentable sugar present in solution therein cannot readily occur; and

(d) continuously fermenting the fermentable sugar, previously adjusted to a pH suitable for carrying out fermentation, with or without partial hydrolysate therein having been previously further saccharified, in a series of fermentation vessels in which the ethanol content of the fermentation medium is progressively increased in each fermentation vessel as the fermentable sugar is consumed therein, the fermentation employing at least two different strains of ethanol-producing yeast, one of which provides a high rate of ethanol production in a fermentation medium containing a relatively low concentration of ethanol and a relatively high concentration of sugar and the other of which provides a high rate of ethanol production in a fermentation medium containing a relatively high concentration of ethanol and a relatively low concentration of fermentable sugar.

4,291,125
METHOD FOR ELECTRONIC CONTROL OF INFECTIONS USING SILVER IONS

Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031

Filed Jan. 16, 1980, Ser. No. 112,704
Int. Cl.[3] C12N 5/00; A01N 59/16
U.S. Cl. 435—240 6 Claims



1. A method of killing plant bacteria and plant viroids to control plant infection while growing plant cells comprising the steps of:
(a) placing a quantity of host plant tissue in an electrolyte nutrient medium; and
(b) treating said host plant tissue with anodically generated silver ions in said medium in an amount sufficient to kill plant bacteria and plant viroids without causing damage to said host plant tissue.

4,291,126
PROCESS FOR MANUFACTURING ALCOHOLS AND MORE PARTICULARLY SATURATED LINEAR PRIMARY ALCOHOLS FROM SYNTHESIS GAS

Andre Sugier, and Edouard Freund, both of Rueil-Malmaison, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 19, 1979, Ser. No. 105,312
Claims priority, application France, Dec. 19, 1978, 78 35870
Int. Cl.[3] C07C 27/06
U.S. Cl. 518—713 26 Claims

1. In a process for manufacturing saturated linear primary alcohols by contacting a gaseous mixture comprising carbon monoxide and hydrogen, and optionally carbon dioxide, with a multimetallic catalyst having a high selectivity for alcohol production, at a temperature of from 150° to 400° C. and a pressure of from 20 to 250 bar;
the improvement wherein said multimetallic selective catalyst comprises at least five elements, said elements, and the proportion by weight of each element as metal relative to the total weight of said elements as metals, being:
(a) copper, from 20 to 60%;
(b) cobalt, from 5 to 50%;
(c) at least one metal M selected from chromium, iron, vanadium and manganese, from 5 to 30%;
(d) at least one rare earth metal N, from 5 to 40%; and
(e) at least one alkali or alkaline earth metal A, from 0.1 to 5%;
whereby the yield of saturated linear primary alcohols having at least two carbon atoms is increased.

4,291,127
PLASTICIZER COMPOSITION

Hiroshi Akabayashi; Eiji Ohyama; Susumu Shoji; Masami Adachi; Koretoshi Uemura, all of Tokyo, and Yoshihisa Ogawa, Ichihara, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

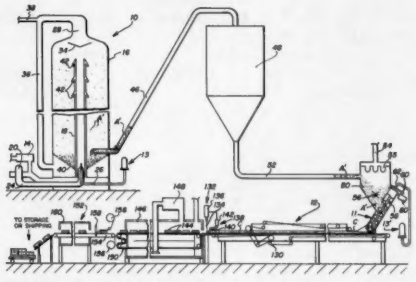
Continuation of Ser. No. 969,869, Dec. 15, 1979, abandoned.
This application May 1, 1980, Ser. No. 145,696
Claims priority, application Japan, Dec. 23, 1977, 52-155410
Int. Cl.[3] C07C 69/80
U.S. Cl. 560—76 3 Claims

1. A plasticizer composition which comprises phthalates of C_9 alcohols obtained by an oxo reaction and a hydrogenation of C_8 olefins which have 3 to 20 wt.% of olefins having one isobutane skeleton and less than 3 wt.% of olefins having quaternary carbon and more than 90 wt.% of a total of n-octenes, monomethylheptenes and dimethylhexenes and 0.8–2.0 of a ratio of a total of n-octenes and monomethylheptenes to dimethylhexenes.

4,291,128
PROCESS FOR MAKING UREA-FORMALDEHYDE INSULATION

Charles E. Elmore, and David H. Harmon, both of Dallas, Tex., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,870
Int. Cl.[3] C08J 9/36
U.S. Cl. 521—54 12 Claims



1. A method of producing cured urea-formaldehyde foam in desired shapes from urea-formaldehyde foam comprising:
(a) forming discrete urea-formaldehyde particles from the urea-formaldehyde foam such that the discrete urea-formaldehyde particles, when cured, are between about one-half and six inches in length and between about one-quarter and one inch in cross-sectional dimension;
(b) curing said discrete urea-formaldehyde particles;
(c) mixing said cured particles with uncured urea-formaldehyde foam to form a resulting mixture that is a coherent mass, wherein said resulting mixture contains said uncured foam and cured particles in a volume ratio of uncured foam to cured particles of between about 1:1 and 1:4;
(d) forming said resulting mixture into the desired shape; and thereafter
(e) curing the uncured urea-formaldehyde foam present in said mixture to provide a cured mass of urea-formaldehyde of the desired shape.

4,291,129

COMPOSITION AND A METHOD FOR CONTROLLING REACTION PRESSURES DURING THE FOAMING PROCESS RESULTING IN AN EASILY FLAME RETARDED FOAM-IN PLACE INSULATION

Richard B. Kennedy, Ridgefield, Conn., assignor to Patrick James. Crehan and Richard J. Fricke, both of Ridgefield, Conn., part interest to each

Filed Jun. 25, 1980, Ser. No. 162,821

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—103 **14 Claims**

1. A low reactive pressure flame-retardant polyurethane foam made by reacting together a polymeric isocyanate, a conventional polyol, a surfactant, a blowing agent and an aqueous solution of a carbohydrate, calcium acid phosphate, sodium aluminum sulfate, sodium bicarbonate, and flame retardant.

4,291,130

PROCESS OF MAKING THERMOSET FOAMS OF ACRYLIC POLYMERS

Frank L. Saunders, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 2, 1980, Ser. No. 109,019

Int. Cl.³ C08J *9/02*; B32B *5/20*

U.S. Cl. 521—136 **3 Claims**

1. A process for producing a thermoset foam consisting essentially of the steps of (1) mixing a normally solid, hydroxy-functional acrylic polymer and an aminoplast resin crosslinking agent and (2) heating the resulting mixture to a heat plastified state until the polymer and crosslinking agent react to form at least one volatile by-product which foams the residual heat-plastified mixture which crosslinks to form the thermoset foam.

4,291,131

PLASTIC NOZZLES OF MOLDABLE POLYETHYLENE AND POLYPROPYLENE POLYMERS HAVING ORGANIC ACIDS DISPERSED THEREIN

John M. McIntire, and Richard H. Blair, both of Kingsport, Tenn., assignors to Permabond International Corp., Englewood, N.J.

Filed Dec. 10, 1979, Ser. No. 101,661

Int. Cl.³ C08F *8/46*

U.S. Cl. 525—5 **7 Claims**

1. A nozzle for use on containers for holding cyanocrylate adhesives, said nozzle being comprised of moldable materials selected from polyethylene, polypropylene and crystallizable copolymers of polypropylene containing up to about 10% ethylene, and having an organic acid selected from the group consisting of citric acid, maleic acid and fumaric acid dispersed in said moldable materials in an amount effective to provide an acidic surface for inhibiting the polymerization of said adhesves within said nozzle.

4,291,132

POLYMERIZATION PROCESS

Michael L. Clifford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 676,342, Apr. 12, 1976, Pat. No. 4,187,278. This application Aug. 22, 1979, Ser. No. 68,628

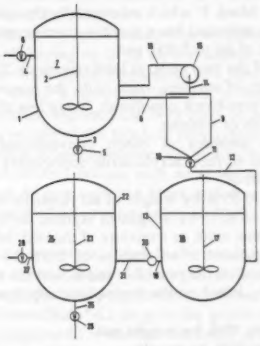
Claims priority, application United Kingdom, Apr. 18, 1975, 16064/75

Int. Cl.³ C08F *2/02, 2/06*

U.S. Cl. 525—53 **8 Claims**

1. A process for the production of an olefine polymer in which polymerization is effected in at least two stages wherein, the one stage, there is present a liquid medium which is at least one liquid olefine monomer and the liquid monomer is polymerized in the presence of a Ziegler olefine polymerization catalyst, a product mixture of a solid olefine polymer and a liquid olefine monomeric phase is removed from the liquid polymerization stage, the liquid olefine monomeric phase is partially separated from the solid olefine polymer to give a concentrated mixture of solid olefine polymer and liquid olefine monomeric phase, which concentrated mixture has a higher content of solid olefine polymer than is in the mixture removed from the liquid polymerization stage, the concentrated mixture is passed to a subsequent polymerization stage and, in the subsequent polymerization stage, at least one gaseous olefine monomer is contacted with the solid olefine polymer in the presence of the Ziegler olefine polymerization catalyst to effect polymerization in the substantial absence of a liquid phase.

8. A process for the production of an olefine polymer in which polymerization is effected in at least two stages wherein, in one stage, there is present a liquid medium which is at least one liquid olefine monomer and the liquid monomer is polymerized in the presence of a Ziegler olefine polymerization



catalyst, a product mixture of a solid olefine polymer and a liquid olefine monomeric phase is removed from the liquid polymerization stage, the liquid olefine monomeric phase is partially separated from the solid olefine polymer to give a concentrated mixture of solid olefine polymer and liquid olefine monomeric phase, which concentrated mixture has a higher content of solid olefine polymer than is in the mixture removed from the liquid polymerization stage, wherein the liquid olefine monomeric phase which has been partially separated from the solid olefine polymer is recycled directly to the stage in which polymerization is effected in a liquid medium and the concentrated mixture is passed to a subsequent polymerization stage in which at least one gaseous olefine monomer is contacted with the solid olefine polymer in the presence of the Ziegler olefine polymerization catalyst to effect polymerization in the substantial absence of a liquid phase.

4,291,133

NONTHROMBOGENIC POLYMER SURFACE

Vaclav Horak, 5508 Oakmont Ave., Bethesda, Md. 20034, and Jiri Janata, 2231 Logan Ave., Salt Lake City, Utah 84108

Filed Apr. 5, 1979, Ser. No. 27,366

Int. Cl.³ C08L *35/00, 27/06, 27/12*

U.S. Cl. 525—74 **10 Claims**

1. A surface-modified polymeric substrate comprising:

a polymeric hydrophobic substrate swellable by selected solvents: and

a branched-chain polymer having a substantially linear hydrocarbon backbone, substantially linear hydrocarbon aliphatic side chains spaced along said backbone and a plurality of pendant reactive groups which are negatively charged or which may be reacted with compounds having a negative charge depending from said backbone, said linear aliphatic side chains having not over twenty (20) carbon atoms and being substantially embedded in said polymeric substrate.

4,291,134
MOLDING MATERIALS CONTAINING STYRENE/ACRYLONITRILE COPOLYMERS AND ETHYLENE OXIDE/PROPYLENE OXIDE THREE-BLOCK COPOLYMERS

Jürgen Hambrecht, Neckargemuend-Dilsberg; Gerhard Lindenschmidt, Leimen, and Walter Regel, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 9, 1980, Ser. No. 138,536

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916668

Int. Cl.[3] **C08L** *25/12, 71/02*

U.S. Cl. 525—92 **3 Claims**

1. A molding material which contains

A. styrene/acrylonitrile copolymers and

B. three-block copolymers X-Y-X, which copolymers contain

b_1. a central block Y which substantially consists of propylene oxide units and has a number-average mean molecular weight of up to 3,000, and

b_2. at each of the two ends, at least one block X, consisting substantially of ethylene oxide units, the proportion of b_2, based on three-block copolymer, being less than 85% by weight, with or without

C. effective amounts of other, conventional additives, wherein the styrene/acrylonitrile copolymers A substantially consist of

(a_1) from 20 to 35% by weight of acrylonitrile units and

(a_2) from 80 to 65% by weight of styrene units and/or α-methylstyrene units, or a mixture of the said units, component B is present in an amount of from 0.1 to 2% by weight, based on the sum of A and B, and the proportions of b_1 and b_2, based on the three-block copolymer X-Y-X, are

(b_1) from 80 to 95% by weight and

(B_2) from 5 to 20% by weight,

whilst the number-average mean molecular weight of (b_1) is greater than 700 and the number-average mean molecular weight of the sum of the X blocks (b_2) is from 140 to 1,000.

4,291,135
BINDERS FOR COATING COMPOSITIONS

Peter Höhlein, Krefeld, and Michael Sonntag, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 49,290, Jun. 18, 1979, abandoned. This application May 22, 1980, Ser. No. 152,567

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827592

Int. Cl.[3] **B05D** *3/02;* **B32B** *15/08, 27/00*

U.S. Cl. 525—101 **4 Claims**

1. Binders for the preparation of coating compositions, obtainable by reacting components A, B and C at 70°–200° C. with elimination of water or alcohol until at least 20% of the theoretically possible quantity of water or alcohol has been eliminated, wherein

component A is 1–97 parts by weight of copolymer resins which contain, per molecule, at least two functional hydroxyl, carboxyl, alkoxy and/or epoxide groups, which resins are prepared by copolymerization of

a. 0–50 parts by weight of at least one hydroxyalkyl ester of acrylic or methacrylic acid having 2–4 C-atoms in the hydroxyalkyl group,

b. 0–60 parts by weight of at least one compound of the group comprising styrene, α-methylstyrene, o-chlorostyrene, p-chlorostyrene, o-, m- or p-methylstyrene, p-tertiary butyl styrene or methyl methacrylate,

c. 10–90 parts by weight of at least one acrylic acid ester having 1–12 C atoms in the alcohol group and/or at least one methacrylic acid ester having 2–12 C-atoms in the alcohol group,

d. 0–30 parts by weight of at least one α,β-mono-olefinically unsaturated mono- or dicarboxylic acid having 3–5 C-atoms and/or dicarboxylic acid having 3–5 C-atoms and/or at least one maleic acid semi-ester having 2–14 C-atoms in the alcohol group, or reaction products thereof with a monoglycidyl compound,

e. 0–50 parts by weight of at least one acrylic or methacrylic acid glycidyl ester, or reaction products thereof with aliphatic and/or aromatic monocarboxylic acids and amino compounds,

f. 0–40 parts by weight of an acrylic or methacrylic acid amide having 1–20 C-atoms in the amino group, or alkoxylated hydroxymethyl acrylic acid amides which may also be produced in situ, and

g. 0–60 parts by weight of acrylonitrile, with the sum of the parts by weight of reactants (a) through (g) being 100;

component B is 97—1 parts by weight of alkyd resins and/or oil-free polyesters; and

component C is 0.5–50 parts by weight of at least one polysiloxane having hydroxyl and/or alkoxy groups.

4,291,136
WATER-CURABLE SILANE MODIFIED ALKYLENE ALKYLACRYLATE COPOLYMER AND A PROCESS FOR ITS PRODUCTION

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 892,153, Mar. 31, 1978, abandoned. This application Aug. 29, 1979, Ser. No. 70,785

Int. Cl.[3] **C08F** *255/02;* **C08L** *23/26, 23/32*

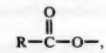
U.S. Cl. 525—102 **32 Claims**

1. A process for preparing a water-curable silane modified alkylene alkylacrylate copolymer which comprises reacting an alkylene alkylacrylate copolymer with a silane characterized by the following formula:

$$X-CH_2)_aSiY_3$$

wherein

X is SH, NH_2 or



wherein R therein is

or C_1 to C_{18} alkyl; R_1 is independently hydrogen or C_1 to C_{18} alkyl; a is an integer of 1 to 18; Y is independently hydrogen, a hydrocarbon radical of 1 to 18 carbon atoms, C_1 to C_{18} alkoxy or $—O—CH_2)_aO—CH_2)_aH$, with the proviso that at least one of Y is other than hydrogen or hydrocarbon,

said reaction being carried out at a temperature between about 25° C. and the volatility temperature of the silane, in the presence of a catalytic amount of organo titanate catalyst.

4,291,137
ONE-PACK HIGH SOLID COATING COMPOSITION

Yasushi Nakate; Hiroshi Iwai, and Kiyoshi Nanishi, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Aug. 31, 1979, Ser. No. 71,795

Claims priority, application Japan, Sep. 8, 1978, 53-110473

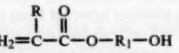
Int. Cl.[3] **C08L** *61/20, 63/00*

U.S. Cl. 525—162 **6 Claims**

1. A one-pack high solid coating composition consisting essentially of

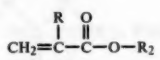
(I) 100 parts by weight of an acrylic resin which is a copolymer having a glass transition temperature of −30° to −50° C. and a hydroxyl number of 40 to 280 and being prepared from

(a) one or more members selected from hydroxyalkyl acrylates and methacrylates of the formula



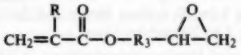
wherein R represents a hydrogen atom or a methyl group and R_1 represents a divalent alkyl group having 2 to 5 carbon atoms, and

(b) one or more members selected from alkyl acrylates and methacrylates of the formula



wherein R is as defined above and R_2 represents a monovalent alkyl group having 1 to 12 carbon atoms,

and glycidyl acrylates and methacrylates of the formula



wherein R is as defined above and R_3 represents a divalent alkyl group having 1 to 5 carbon atoms,

(II) 20 to 160 parts by weight of an amino-formaldehyde resin etherified with a monohydric alcohol having 1 to 4 carbon atoms, and

(III) 0.5 to 6 parts by weight, per 100 parts by weight of the total of the acrylic resin as component (I) and the etherified amino-formaldehyde resin as component (II) combined, of a sulfonic acid catalyst blocked by an epoxy resin, said amount of the blocked acid catalyst being expressed in the amount of its acid.

4,291,138

PRODUCTION OF MODIFIED POLYPROPYLENES

Hideo Sato, Yokkaichi, and Toshio Yagi, Aichi, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Japan

Filed Nov. 19, 1979, Ser. No. 95,922
Claims priority, application Japan, Nov. 24, 1978, 53-145164
Int. Cl.[3] C08F *297/08*
U.S. Cl. 525—247 **11 Claims**

1. A process for producing a modified polypropylene in the presence of a stereoregular polymerization catalyst which comprises, in combination:

Step 1 wherein propylene is polymerized at a temperature of not higher than 60° C. to produce 0.5 to 30% by weight of a crystalline propylene polymer on the basis of the total polymerization product obtained in Steps 1 through 3;

Step 2 wherein propylene is further polymerized at a temperature which is at least 10° C. higher than that of Step 1 to produce 60 to 95% by weight of a crystalline propylene polymer on the basis of the total polymerization product in Steps 1 through 3, the quantity of the crystalline propylene polymer being the total quantity through Steps 1 and 2; and

Step 3 wherein a member selected from the group consisting of ethylene and an ethylene-propylene mixture is polymerized to produce 5 to 40% by weight of an ethylene polymer on the basis of the total polymerization product in Steps 1 through 3, the ethylene content in the resulting ethylene polymer being 100 to 20% by weight.

4,291,139

PROCESS FOR PREPARATION OF BLOCK COPOLYMERS

Adel F. Halasa, Bath; James E. Hall, and Adolph Para, both of Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 9, 1977, Ser. No. 776,048
Int. Cl.[3] C08F *297/04*
U.S. Cl. 525—314 **11 Claims**

1. In the process of preparing block copolymers predominantly of the structure S-B-S with one or two small polybutadiene terminal blocks, wherein S represents a block of polystyrene and B represents a block of polybutadiene, by the steps of polymerizing the individual monomers to form the respective blocks, such polymerizations being initiatated by a lithium compound, the improvement whereby:

(a) said polymerization is effected in a solvent consisting essentially of hexane;

(b) said polymerization is initiated by a hydrocarbyl lithium compound having up to 10 carbon atoms;

(c) as a precursor to the preparation of a first block of polystyrene, there is prepared initially a block of homopolybutadiene representing 2–12 parts by weight per 100 parts by weight of the block of polystyrene to which this initial block of polybutadiene will be attached, by reacting said hydrocarbyl lithium with an appropriate amount of butadiene to give said size block and thereby produce a polybutadiene*-Li product, wherein * indicates said small size block;

(d) sufficient styrene is added to the product of step (c) to give the desired molecular weight of the desired first S block and effecting polymerization of said styrene with said polybutadiene*-Li to give the product polybutadiene*-polystyrene-Li while still dispersed in said hexane;

(e) thereafter adding an appropriate amount of butadiene to the dispersed product of step (d) to form a desired size block of polybutadiene and effecting polymerization of said butadiene with said polybutadiene*-polystyrene-Li to give the product polybutadiene*-polystyrene-polybutadiene-Li while still dispersed in said hexane, and

(f) thereafter effecting the addition of a second block of polystyrene onto said polybutadiene*-polystyrene-polybutadiene-Li.

4,291,140

NOVEL PROPYLENE COPOLYMERS

Masaki Fujii; Mitsutaka Miyabayashi, both of Yokkaichi; Hironori Todaka, Suzuka, and Satoru Hattori, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Japan

Filed Oct. 20, 1980, Ser. No. 198,921
Claims priority, application Japan, Oct. 24, 1979, 54-137171
Int. Cl.[3] C08F *297/08*
U.S. Cl. 525—321 **5 Claims**

1. A propylene copolymer which comprises a block comprising a homopolymer of propylene and a block comprising a ternary random copolymer of propylene, ethylene, and hexene-1, and in which:

(a) the proportion of the propylene homopolymer block in the propylene copolymer is 3 to 20 percent by weight;

(b) the proportion of the ternary randon copolymer block in the propylene copolymer is 97 to 80 percent by weight;

(c) the ternary random copolymer block comprises the portions based on the propylene, ethylene, and hexene-1 of 80 to 98 percent, 5 to 1 percent, and 15 to 1 percent, respectively, all percentages being by weight; and

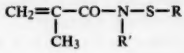
(d) the intrinsic viscosity of the propylene copolymer in decalin at 135° C. is 0.3 to 15 dl/g.

4,291,141
VULCANIZABLE RUBBER COMPOSITIONS CONTAINING N-(SULFENYL) METHACRYLAMIDES AS SCORCH INHIBITORS

Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 30, 1979, Ser. No. 62,265
Int. Cl.³ C08C *19/22, 19/20*
U.S. Cl. 525—351 **11 Claims**

1. A vulcanizable rubber composition comprising sulfur-vulcanizable diene rubber, sulfur-vulcanizing agent, organic vulcanization accelerating agent and, in an amount effective to inhibit premature vulcanization, a compound of the formula



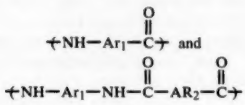
in which R and R′ are the same or different radicals selected from the group consisting of primary or secondary alkyl of 1–20 carbon atoms, benzyl, cycloalkyl of 5–12 carbon atoms, phenyl or mono-, di-, or tri-substituted phenyl wherein the substituents are lower alkyl, lower alkoxy or halo, or R′ is —SR.

4,291,142
CROSSLINKED AROMATIC POLYAMIDE FILM AND PROCESS FOR PRODUCING THE SAME

Yorikazu Tamura; Akihiro Aoki, and Keizo Shimada, all of Iwakuni, Japan, assignors to Teijin, Limited, Osada, Japan

Filed Jul. 6, 1979, Ser. No. 55,475
Claims priority, application Japan, Jul. 18, 1978, 53-86785
Int. Cl.³ C08G *69/48*
U.S. Cl. 525—420 **11 Claims**

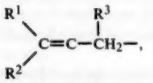
1. An aromatic polyamide film comprising at least one aromatic polyamide containing repeating units of the formula selected from the group consisting of



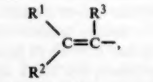
(I)

(II)

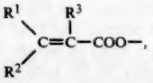
wherein Ar_1 and Ar_2 respectively represent, independently from each other, a member of the group consisting of unsubstituted and substituted divalent aromatic radicals which comprise a single aromatic ring, two or more aromatic rings that are condensed together, two or more aromatic rings that are linked together by a single bond, or two more aromatic rings that are linked together by a bridging atom or radical, which is oriented either meta or para, said aromatic polyamide molecules being cross-linked with at least one cross-linking compound selected from the group consisting of compounds which have at least one radical selected from the group consisting of radicals of the formulae (III), (IV), (V) and (VI):



(III)



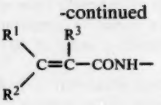
(IV)



(V)

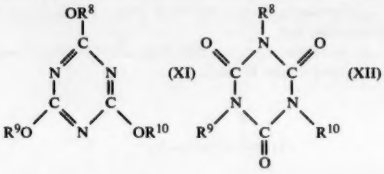
and

-continued



(VI)

wherein R^1, R^2, and R^3 respectively represent, independently from each other, a member selected from the group consisting of hydrogen and alkyl radicals having 1 to 6 carbon atoms, and compounds of the formulae (XI) and (XII):



(XI) (XII)

wherein R^8, R^9 and R^{10} respectively represent, independently from each other, a member selected from the group consisting of hydrogen, alkyl radicals having 1 to 10 carbon atoms, hydroxyalkyl radicals having 1 to 10 carbon atoms, carboxyalkyl radicals having 1 to 10 carbon atoms and halogenated alkyl radicals having 1 to 10 carbon atoms.

4,291,143
POLYMERIZATION OF UNSATURATED HYDROCARBYL HALIDE COMPOUNDS

Edwin H. Homeier, Maywood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 16, 1979, Ser. No. 67,083
Int. Cl.³ C08F *4/78*
U.S. Cl. 526—123 **10 Claims**

1. A process for the polymerization of an unsaturated hydrocarbyl halide compound which comprises treating said compound at a temperature in the range of from about 50° C. to about 200° C. and a pressure in the range of from about atmospheric to about 100 atmospheres in the presence of a catalyst comprising a Group VIB metal carbonyl and a promoter selected from the group consisting of an alkali metal hydroxide, an alkali metal carbonate and an alkali metal hydrogen carbonate, and recovering a polymer resultant from said polymerization.

4,291,144
EPOXY-BASED CURABLE COMPOSITIONS

Toshio Takago, Annaka, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

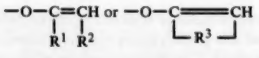
Filed Feb. 6, 1980, Ser. No. 119,114
Claims priority, application Japan, Feb. 15, 1979, 54-16502
Int. Cl.³ C08G *77/04*
U.S. Cl. 528—26 **7 Claims**

1. A room temperature-curable epoxy resin composition which comprises

(a) an epoxy compound having at least two epoxy groups in a molecule,

(b) a curing agent, and

(c) an organosilicon compound having, in a molecule, at least one group represented by the general formula



wherein R^1 and R^2 are each a hydrogen atom or a monovalent hydrocarbon group and R^3 is a divalent hydrocarbon group, directly bonded to the silicon atom.

4,291,145

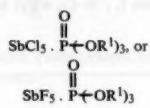
ANTIMONY HALIDE-ORGANIC PHOSPHATE ESTER CATIONIC POLYMERIZATION CATALYSTS

Robert J. Balchunis, St. Paul, and Stephen W. Bany, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 26, 1980, Ser. No. 124,837
Int. Cl.[3] C08F 4/20; C08G 2/06
U.S. Cl. 528—89 5 Claims

1. A method for polymerizing a cationically polymerizable organic monomer comprising the steps:

(a) providing a latent polymerizable composition consisting of a solution of said organic monomer in a polar organic solvent and an effective amount of an antimony pentahalide-organic phosphate ester complex catalyst of the formula:



wherein:

R^1 is independently selected from alkyl groups of 1 to 18 carbon atoms,

(b) removing said solvent to form a residue, and

(c) heating the resulting residue to a temperature in the range of 50° to 150° C. to effect curing of said organic monomer.

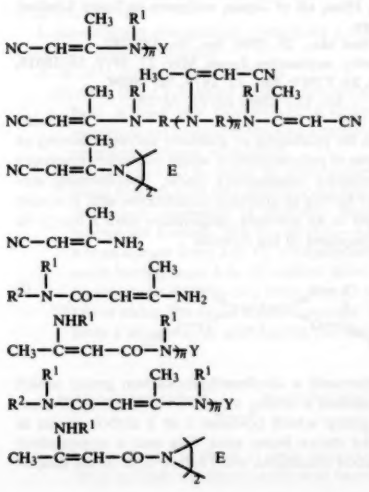
4,291,146

HEAT-CURABLE MIXTURES, WHICH ARE STABLE ON STORAGE, OF EPOXIDE RESINS AND β-AMINOCROTONIC ACID DERIVATIVES

Theobald Haug, Frenkendorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,014
Int. Cl.[3] C08G 59/52
U.S. Cl. 528—119 4 Claims

1. A heat-curable mixture which is stable on a storage, which contains (a) an epoxide compound with, on average, more than one epoxide group in the molecule and (b) a β-aminocrotonic acid derivative of the formula I to X



(I)

(II)

(III)

(IV)

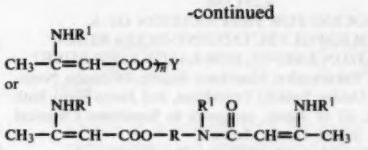
(V)

(VI)

(VII)

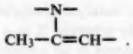
(VIII)

-continued



(IX)

in which R^1 and R^2 independently of one another are each a hydrogen atom, alkyl having 1 to 6 C atoms, cycloalkyl having 5 or 6 C atoms or aryl having 6 to 10 C atoms, Y is a n-valent organic radical having 2 to 30 C atoms, R is an aromatic or aliphatic radical having not more than 30 C atoms, E, together with the two N atoms, is a heterocyclic, five-membered or six-membered ring and n is a number from 1 to 3, the curable mixture containing 2 to 8 epoxide equivalents per 1 equivalent of β-aminocrotonic acid derivative, containing the grouping



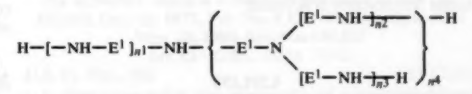
4,291,147

POLYADDUCTS OF AMMONIA AND EPOXIDE COMPOUNDS, PROCESSES FOR THEIR MODIFICATION, AND THEIR USE

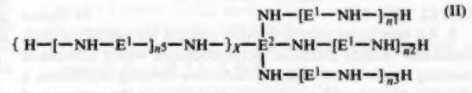
Fritz E. Kempter, Mannheim; Eberhard Schupp, Schwetzingen; Hans-Uwe Schenck, Wachenheim, and Erich Gulbins, Heidelberg-Neuenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 137,748
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1979, 2914297
Int. Cl.[3] C08G 59/40
U.S. Cl. 528—119 6 Claims

1. A polyadduct of ammonia and epoxide compounds, which consists of epoxide-free reaction products of ammonia and diepoxides, triepoxides and/or tetraepoxides, from 1.75 to 10 moles of ammonia having been employed per epoxide group and 1 mole of ammonia having been reacted with from 1.2 to 2.0 equivalents of epoxide, so that if diepoxide compounds are used products of the general formula (I)



are obtained, whilst if triepoxides and/or tetraepoxide compounds are used, by themselves, or together with diepoxide compounds, products of the general formula II



(II)

are produced; in these formulae, the E^1's are identical or different hydroxyl-containing divalent radicals and the E^2's are identical or different hydroxyl-containing trivalent or tetravalent radicals, resulting from the opening of the oxirane rings of epoxide compounds containing two, three or four epoxide groups in the molecule, n^1, n^3 and n^5 are from 0 to 3, n^2 and n^4 are from 1 to 3 and X is 0 or 1, and one or more of the divalent radicals E^1 in the general formula (II) may or may not be replaced by polyvalent radicals E^2.

4,291,148

PROCESS FOR PREPARATION OF A PHENOLIC-POLYBUTADIENE-HCHO RESIN COMPOSITION USEFUL FOR LAMINATED SHEET

Seimei Yasui, Takarazuka; Masakazu Sagou; Takanobu Noguchi, both of Osaka; Yoshiki Toyoshima, and Junzo Saito, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 12, 1979, Ser. No. 47,946

Claims priority, application Japan, Mar. 2, 1979, 54-24823

Int. Cl.[2] C08G *8/12, 8/30*

U.S. Cl. 528—142 **9 Claims**

1. A process for the preparation of a phenol resin modified with a liquid polybutadiene, which comprises reacting a polybutadiene having a number average moleuclar weight of 150 to 5,000 with a phenol in the presence of an acid catalyst to obtain a composition of a polybutadiene-phenol adduct wherein one molecule of phenol per 3 to 8 butadiene units is added to the polybutadiene, and reacting the composition of the polybutadiene-phenol adduct with a formaldehyde in the presence of a basic catalyst, said basic catalyst comprising a primary amine of the formula: R—NH_2 wherein R is a hydrocarbon group having 1 to 20 carbon atoms in an amount of 0.01 to 0.5 mole per 1 mole of the phenol used for the preparation of the composition.

4,291,149

INJECTION MOLDABLE AMIDE IMIDE COPOLYMERS AND TERPOLYMERS

Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 16, 1980, Ser. No. 112,651

Int. Cl.[3] C08G *69/26, 69/32*

U.S. Cl. 528—188 **36 Claims**

1. A process for the preparation of tailored linear injection moldable polyamide-imide copolymers and terpolymers containing both aromatic and aliphatic moieties derived from aromatic and aliphatic diamines which process comprises reacting at a temperature of about 50° to 700° F. fully or partially acylated, aromatic or aliphatic diamines with tricarboxylic acid anhydride compounds and aliphatic or aromatic diamines wherein the ratio of the total moles of fully or partially acylated diamines and unacylated diamines to the tricarboxylic acid anhydride compound is 1:1 and about one half of the total amine functionality is acylated.

4,291,150

PROCESS FOR PREPARING POLYCARBONATE USING NON-CYCLIC POLYAMINE CATALYSTS

Victor Mark, Evansville, Ind., assignor to General Electric Co., Mt. Vernon, Ind.

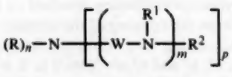
Filed Dec. 28, 1979, Ser. No. 107,721

Int. Cl.[3] C08G *63/62*

U.S. Cl. 528—199 **14 Claims**

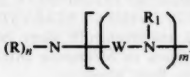
1. An interfacial polymerization process for preparing high molecular weight aromatic polycarbonates which comprises reacting, under interfacial polycarbonate-forming conditions, a dihydric phenol with a carbonate precursor in the presence of a catalytic amount of a non-cyclic polyamine of the formula

Formula 1



and its acid addition salts, or a non-cyclic polyamine of the formula

Formula 2



and its acid addition salts wherein n is an integer equal to 3-p; p is an integer having a value from 1 to 3, inclusive; m is an integer having a value from 1 to 3, inclusive; R, R^1 and R^2 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl, substituted cycloalkyl, and aralkyl radicals; W is selected from the group consisting of divalent aliphatic and cycloaliphatic radicals; and X is a 5 to 6 membered nitrogen-containing heterocyclic radical selected from the group consisting of pyrrole, mono to tetra C_1 to C_5 alkyl substituted pyrrole, pyridine, and mono to tetra C_1 to C_5 alkyl substituted pyridine radicals.

4,291,151

PROCESS FOR PREPARING POLYCARBONATE USING CYCLIC DI- OR TRIAMINE CATALYST

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 28, 1979, Ser. No. 107,730

Int. Cl.[3] C08G *63/62*

U.S. Cl. 528—199 **16 Claims**

1. An interfacial polymerization process for preparing high molecular weight aromatic polycarbonates which comprises reacting, under interfacial polycarbonate-forming conditions, a dihydric phenol with a carbonate precursor in the presence of a catalytic amount of a catalyst selected from the group consisting of, cyclic triamines, and salts of cyclic triamines.

4,291,152

PROCESS FOR PRODUCING AROMATIC POLYESTERS HAVING INCREASED DEGREES OF POLYMERIZATION

Hiroo Inata, Hino; Shunichi Matsumura, Hachioji, and Makoto Ogasawara, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

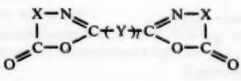
Filed Mar. 25, 1980, Ser. No. 133,797

Claims priority, application Japan, Mar. 27, 1979, 54/35010; May 14, 1979, 54/57985; Jun. 22, 1979, 54/78009

Int. Cl.[3] C08G *63/44, 73/16*

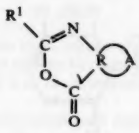
U.S. Cl. 528—289 **26 Claims**

1. A process for producing an aromatic polyester having an increased degree of polymerization which comprises reacting a hydroxyl-terminated, substantially linear, fiber-forming aromatic polyester having an aromatic dicarboxylic acid as a main acid component at an elevated temperature with a bis-cyclic imino ester compound of the formula



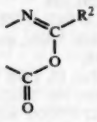
(I)

wherein Y represents a divalent hydrocarbon group which may further contain a hetero atom, X represents a divalent hydrocarbon group which contains 1 or 2 carbon atoms as members of the above imino ester ring and is non-reactive under the reaction conditions, and l is 0 or 1, or of the following formula



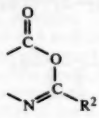
(II)

wherein A represents a grouping of the formula



(II)-a

in which R^2 represents a monovalent hydrocarbon group, or a grouping of the formula



(II)-b

in which R^2 is as defined above, R represents a tetravalent aromatic group which may further contain a hetero atom, and R^1 represents a monovalent aromatic hydrocarbon which is identical to or different from R^2;

thereby bonding the molecular chains of the aromatic polyester to each other by the terminal hydroxyl groups thereof and forming rapidly said aromatic polyester having an increased degree of polymerization.

4,291,153

WATER-DISPERSIBLE POLYESTER ADHESIVES FOR PHOTOGRAPHIC MATERIALS

John M. Noonan, and Robert C. McConkey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,419
Int. Cl.³ C08G *63/68, 75/00*
U.S. Cl. 528—290 **21 Claims**

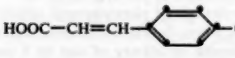
1. An adhesive composition comprising a water-dispersible polyester which comprises

A. an acid component comprising:

(1) from about 8 to about 16 mole percent of units derived from at least one dicarboxylic acid having an ionic iminosulfonyl moiety containing a monovalent cation as an imino nitrogen substituent;

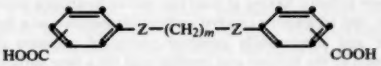
(2) from about 40 to about 70 mole percent of units derived from at least one dicarboxylic acid selected from the group consisting of aliphatic dicarboxylic acids having the formula $HOOC—(CH_2)_n—COOH$ wherein n is an integer from 2 to 12, cycloaliphatic dicarboxylic acids having from 6 to 22 carbon atoms and aromatic dicarboxylic acids having from 6 to 12 carbon atoms;

(3) from about 5 to about 20 mole percent of units derived from a dicarboxylic acid having the formula:



; and

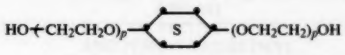
(4) from about 5 to about 25 mole percent of units derived from at least one dicarboxylic acid having the formula:



wherein Z is selected from the group consisting of carbonylimino and iminocarbonyl and m is an integer from 6 to 10; and

B. a diol component consisting essentially of:

(1) at least 50 mole percent of units derived from at least one diol having a formula selected from the group consisting of:



(I)

wherein p is an integer from 1 to 4, and

(II)

wherein q is an integer from 2 to 4 and R is alkylene having from 2 to 4 carbon atoms; and

(2) from 0 to 50 mole percent of units derived from at least one diol having the formula

wherein R′ is an alkylene group having up to 16 carbon atoms, cycloalkylene having from 6 to 20 carbon atoms, cycloalkylenebisalkylene having from 8 to 20 carbon atoms, or arylenebisalkylene having from 8 to 20 carbon atoms,

with the proviso that said diol component (1), selected from the group consisting of (I) and (II), must comprise at least 90 mole percent of the diol component when said acid component (1), having an ionic iminosulfonyl moiety, comprises less than 10 mole percent of said acid component.

4,291,154

PROCESS FOR THE PRODUCTION OF POLYAMIDE SILICATE RESINOUS PRODUCT

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 908,106, May 22, 1978, Pat. No. 4,198,491, which is a continuation-in-part of Ser. No. 845,464, Oct. 25, 1977, Pat. No. 4,120,937. This application Mar. 13, 1980, Ser. No. 130,015
Int. Cl.³ C08G *69/26, 77/02*
U.S. Cl. 528—335 **13 Claims**

1. The process for the production of polyamide silicate resinous product by mixing and reacting the following components:

(a) halosilicon acids, 0.5 to 1 mol, produced by reacting 0.5 to 2 mols of hydrated silica compound with 1 mol of a silicon halide; the mols of halosilicon acid is based on the mols of silicon halide used,

(b) organic polyamine, 1 to 2 mols,

(c) polycarboxylic acid, polycarboxylic acid anhydride, or mixture thereof, 1 to 2 mols.

4,291,155

METHOD OF MAKING LACTONE-EPOXIDE COPOLYMER POLYOLS

Jacques Brochet, Bethune, France, assignor to Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Mar. 14, 1979, Ser. No. 20,343
Claims priority, application France, Mar. 14, 1978, 78 07256
Int. Cl.³ C08G *63/08, 63/10*
U.S. Cl. 528—358 **6 Claims**

1. A method for the manufacture of a copolymeric polyol

comprising forming a reaction mixture of a lactone, an epoxide, a chain initiator having at least two active hydrogen atoms per mole, and an alkaline catalyst and copolymerizing at a temperature and substantially constant corrected pressure during addition of the lactone and epoxide and for a time sufficient to form a copolymeric polyol having the general formula:

$$I—PCL—PCL—POA)_mOH]_n$$

wherein I represents the remainder of the initiator, PCL represents a lactonic polyester sequence, POA represents a polyether sequence, m has a mean value less than 2, and n is an integer from 2 to 6, said copolymeric polyol having a central portion predominating in polylactone segments and terminal portions predominating in polyether segments.

4,291,156

POLYSACCHARIDE S-53 AND BACTERIAL FERMENTATION PROCESS FOR ITS PREPARATION

Kenneth S. Kang, La Jolla, and George T. Veeder, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 28, 1979, Ser. No. 16,253
Int. Cl.[3] C12P *19/06*
U.S. Cl. 536—1 **1 Claim**

1. Heteropolysaccharide S-53, containing 4.8% pyruvate, 7% acetyl, and 18–19% uronic acid; the rest being neutral sugar, 51% glucose and 49% fucose; said heteropolysaccharide being incompatible with methylene chloride dye and compatible with milling green dye, being substantially insoluble in water-miscible alcohols, such as methanol, ethanol and isopropanol, and ketones like acetone, and soluble in water and having an infrared spectra characterized by peaks at 3400 cm^{-1}, 2950 cm^{-1}, 1720 cm^{-1}, and 1600 cm^{-1}.

4,291,157

OCTANOYLHYDRAZONE DERIVATIVES OF ADRIAMYCIN

David W. Henry, Chapel Hill, N.C., and George L. Tong, Cupertino, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 22, 1980, Ser. No. 171,083
Int. Cl.[3] A61K *31/71;* **C07H** *15/24*
U.S. Cl. 536—17 A **2 Claims**

1. Adriamycin octanoylhydrazone and its pharmaceutically acceptable acid addition salts.

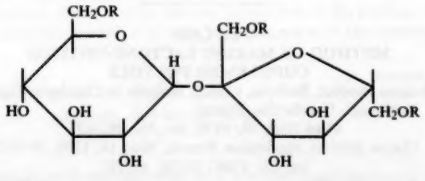
4,291,158

SUCROSE ESTER OF 2-METHOXY-3,6-DICHLOROBENZOIC ACID

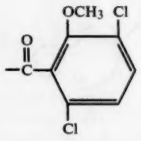
George F. Luteri, Mt. Prospect, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 28, 1980, Ser. No. 115,637
Int. Cl.[3] C07H *13/00, 11/00, 15/00*
U.S. Cl. 536—115 **1 Claim**

1. The compound sucrose tri(2-methoxy-3,6-dichlorobenzoate) having the formula



wherein each R is



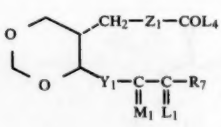
4,291,159

9,11-DIDEOXY-10-OXA-TXB INTERMEDIATES

Douglas R. Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 19,752, Mar. 12, 1979. This application Jan. 28, 1980, Ser. No. 116,323
Int. Cl.[3] C07D *319/06, 405/12*
U.S. Cl. 542—400 **1 Claim**

1. A thromboxane intermediate of formula IX,



IX

wherein Y_1 is
(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) —CH_2CH_2—, or
(4) -C≡C-,
wherein M_1 is α-R_5:β-OH, α-OH:β-R_5, or α-H:β-H, wherein R_5 is hydrogen or methyl;
wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and β-R_3:α-R_4, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_1 is
(1) cis—CH=CH-CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—(CH_2)—$_g$—CH_2—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—, or
(8) trans-CH_2—$(CH_2)_g$—CH_2—CH=CH—;
wherein g is one, 2 or 3;
wherein R_7 is
(1) —$(CH_2)_m$—CH_3, wherein m is an integer from one to 5 inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, two, or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, icnlusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, two, or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, two, or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are

(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(vii) carboxyalkyl of 2 to 5 carbon atoms, inclusive;
(viii) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;
(ix) cyanoalkyl of 2 to 5 carbon atoms, inclusive;
(x) acetylalkyl of 2 to 5 carbon atoms, inclusive;
(xi) benzoylalkyl of 7 to 11 carbon atoms, inclusive;
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xiii) pyridyl;
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(xv) pyridylalkyl of 6 to 9 carbon atoms, inclusive;
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or alkoxy of one to 3 carbon atoms, inclusive;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms, or
(xix) trihydroxyalkyl of one to 4 carbon atoms;

with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of

(i) pyrrolidino,
(ii) piperidino,
(iii) morpholino,
(iv) piperazino,
(v) hexamethyleneimino,
(vi) pyrrolino,
(vii) 3,4-didehydropiperidinyl, or
(viii) pyrrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl substituted by one or two alkyl of one to 12 carbon atoms, inclusive;

(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is other than hydrogen, but otherwise as defined above; or

(d) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined in (c).

4,291,160
7-(1,3-DITHIOLAN-2-IMINO)-Δ^2-CEPHALOSPORANIC ACID DERIVATIVES

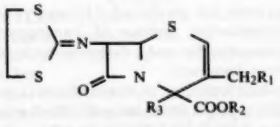
Boyd L. Harrison, and Joseph E. Dolfini, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 19,415, Mar. 12, 1979, Pat. No. 4,208,516. This application Nov. 5, 1979, Ser. No. 91,464

Int. Cl.³ C07D *501/16*

U.S. Cl. 544—17 **4 Claims**

1. A 7-(1,3-dithiolan-2-imino)-Δ^2-cephalosporanic acid derivative having the formula



wherein

R_1 is selected from the group consisting of 5-methyl-1,3,4-thiadiazol-2-ylthio, 1-methyl-1,2,3,4-tetrazol-5-ylthio and 1,2,3-triazol-4-ylthio;

R_2 is selected from the group consisting of hydrogen, t-butyl, 2,2,2-trichloroethyl, benzhydryl, formyloxymethyl and alkanoyloxymethyl in which the alkanoyl group contains from 2 to 5 carbon atoms;

R_3 is selected from the group consisting of alkyl having from 1 to 4 carbon atoms, carboxymethyl, alkoxycarbonyl and (alkoxycarbonyl)methyl wherein the alkoxy group has from 1 to 4 carbon atoms, halomethyl, benzyl and substituted benzyl wherein the benzyl substituent is methoxy or halo;

and the pharmaceutically acceptable salts thereof.

4,291,161
TRIMERIZATION OF METHYL-ISOTHIOCYANATE AND N,N',N''-TRIMETHYL 2-IMINODITHIOISOCYANURATE

Hendrik Dolman, and Johannes Kuipers, both of Weesp, Netherlands, assignors to Dupaar International Research B.V., Netherlands

Division of Ser. No. 952,376, Oct. 18, 1978, Pat. No. 4,221,792. This application Feb. 25, 1980, Ser. No. 123,880

Claims priority, application Netherlands, Nov. 4, 1977, 7712169

Int. Cl.³ C07D *251/46, 251/38*

U.S. Cl. 544—193 **3 Claims**

1. A method of preparing N,N',N''-trimethyl trithioisocyanurate by trimerization of methylisothiocyanate, wherein the trimerization is carried out in the presence of sodium hydride in a dipolar organic solvent.

3. N,N',N''-trimethyl 2-iminodithioisocyanurate.

4,291,162
AMINOTRIAZINEPOLYCARBOXYLIC ACIDS AND PARTIAL ESTERS THEREOF

Derek J. R. Massy, Linton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

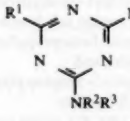
Filed Jul. 15, 1980, Ser. No. 169,063

Claims priority, application United Kingdom, Jul. 25, 1979, 25963/79

Int. Cl.³ C07D *251/70, 251/48*

U.S. Cl. 544—199 **9 Claims**

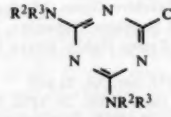
1. A compound of the formula



I

where

R^1 represents a group of formula $—NR^2R^3$, a straight chain or branched alkyl group of from 1 to 17 carbon atoms, a mononuclear aryl group of 6 to 10 carbon atoms, a phenylalkylene group wherein the alkylene moiety has from 1 to 4 carbon atoms, or a group of formula

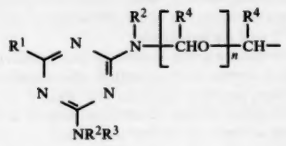


II

R^2 and R^3 may be the same or different and each represents a hydrogen atom, a group of formula $—CHR^4OR^5$, a group of formula

$—CHR^4—S—R^6—COOQ$ IIA

or a group of formula



III

R^2 and R^3 in formulae I and III being selected such that at most one of them represents a group of formula III and at least two of them each represent a group of formula IIA;

m represents an integer of from 1 to 3;

each R^4 represents a hydrogen atom or a straight chain or branched alkyl group of from 1 to 3 carbon atoms;

each R^5 represents a hydrogen atom or a straight chain or branched alkyl group of from 1 to 8 carbon atoms;

each R^6 represents a divalent straight chain or branched alkylene group of from 1 to 4 carbon atoms, or a divalent straight chain or branched alkylene group of from 1 to 4 carbon atoms which is substituted by a group of formula

—COOQ IIB;

each Q represents a hydrogen atom or a straight chain or branched alkyl group of from 1 to 8 carbon atoms, such that at least two Q in the formulae IIA and IIB each represent a hydrogen atom; and n represents zero or 1.

4,291,163

DECAHYDROQUINOLINE-2-CARBOXYLIC ACID COMPOUNDS

George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 23, 1980, Ser. No. 114,675

Int. Cl.[3] C07D *215/16*

U.S. Cl. 546—164 **1 Claim**

1. A compound selected from the group consisting of:

A. 1-(3-Benzoylthio-1-oxopropyl-decahydroquinoline-2-carboxylic acid dicyclohexylamine salt hemihydrate,

B. Decahydro-1-(3-mercapto-1-oxopropyl)quinoline-2-carboxylic acid tetartohydrate; and

C. Decahydro-1-(3-mercapto-1-oxopropyl)quinoline-2-carboxylic acid sodium salt ⅜ hydrate.

4,291,164

CEPHALOSPORIN ANALOGS AND METHODS FOR PRODUCTION THEREOF

Tadashi Hirata, Yokohama; Takehiro Ogasa, Machida; Hiromitsu Saito, Machida, and Nobuhiro Nakamizo, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

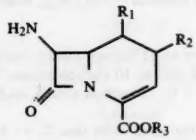
Filed Mar. 23, 1979, Ser. No. 23,645

Claims priority, application Japan, Mar. 20, 1978, 53-34696; Oct. 4, 1978, 53-122404; Oct. 28, 1978, 53-133072; Dec. 26, 1978, 53-162005; Jan. 27, 1979, 54-8408

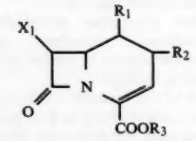
Int. Cl.[3] C07D *221/02*

U.S. Cl. 546—183 **3 Claims**

1. A process for producing compounds represented by the formula



wherein R_1 represents a hydrogen atom, a halo group, a hydroxy group, a lower alkoxy group having 1 to 5 carbon atoms, a lower alkylthio group having 1 to 5 carbon atoms, a phenylthio group, a benzylthio group, a lower alkylsulfinyl group corresponding to the alkylthio group described above, a lower alkylsulfonyl group corresponding to the alkylthio group described above, a phenylsulfonyl group corresponding to the phenylthio group described above, or a benzylsulfonyl group corresponding to the benzylthio group described above, R_2 is a group as defined for R_1 or represents an alkanoyl group, a lower alkyl group having 1 to 5 carbon atoms, a lower alkyl group having 1 to 5 carbon atoms and substituted with a halo group, a nitrile group or an amino group represented by the formula NR_9R_{10} wherein R_9 and R_{10} may be the same or different and represent a hydrogen atom, a lower aklyl group having 1 to 5 carbon atoms, a phenyl group, or a benzyl group, wherein the alkyl group in R_1 and R_2 is a straight-chain alkyl group, and R_3 represents a hydrogen atom or a substituted or unsubstituted alkyl, aryl, aralkyl or silyl group selected from methyl group, ethyl group, n-propyl group, isopropyl group, n-butyl group, isobutyl group, t-butyl group, a chloromethyl group, 2,2,2-trichloroethyl group, 2,2,2-trifluoroethyl group, benzyl group, diphenylmethyl group, triphenylmethyl group, trimethylsilyl group and triphenylsilyl group, among which benzyl group, diphenylmethyl group and triphenylmethyl group may have a methoxy or nitro group on the phenyl group, and acid addition salts thereof, wherein an X_1 group of the compound represented by the formula



wherein X_1 represents an azido group and R_1, R_2 and R_3 have the same significance as defined above is reduced by catalytic reduction to an amino group using pallidium on charcoal, Raney nickel, palladium black or platinum oxide at a temperature of 0° to 100° C. and at a pressure of 1 to 50 atmospheres.

4,291,165

PROCESS FOR MAKING 2-BROMOPYRIDINE

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 18, 1980, Ser. No. 179,390

Int. Cl.[3] C07D *213/61*

U.S. Cl. 546—345 **18 Claims**

1. In the process for producing 2-bromopyridine by the diazotization-bromination reaction of 2-aminopyridine with HBr in the presence of Br_2 and a diazotization agent, wherein the improvement comprises:

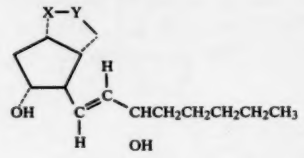
conducting said reaction in the additional presence of H_2SO_4, employing a molar ratio of HBr:2-aminopyridine in the range from about 1:1 to about 3.5:1, and employing a molar ratio of H_2SO_4:HBr in the range from about 2:8 to about 8:2.

4,291,166
PHARMACEUTICALLY ACTIVE 6,9-THIAPROSTACYCLIN ANALOGS AND DERIVATIVES THEREOF

Kyriacos C. Nicolaou, Philadelphia; William E. Barnette, Levittown, both of Pa., and Ronald L. Magolda, Vineland, N.J., assignors to Research Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,141
Int. Cl.³ C07D *333/78*
U.S. Cl. 549—51 **15 Claims**

1. Biologically active 6,9α-thiaprostacyclin derivatives having the formula:



wherein

X represents >S, >SO or >SO_2;

Y represents (E) and (Z) >C=CH—$CH_2CH_2CH_2COOR$; (E)>CH—CH=CH—C_2CH_2COOR or >CH—$CH_2CH_2CH_2CH_2COOR$; and

R represents a pharmaceutically acceptable cation or a pharmaceutically acceptable lower alkyl group.

4,291,167
PREPARATION OF TETRAMETHYLDISILANE FROM 1,2-TETRAMETHYLDICHLORODISILANE

Ronald J. Allain, Naperville, Ill., and Joseph P. Maniscalco, Sugar Land, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 28, 1980, Ser. No. 172,611
Int. Cl.³ C07F *7/08*
U.S. Cl. 556—430 **5 Claims**

1. A process of producing TMDS by:

(a) reacting purified TMDCDS with a substoichiometric mixture of NaH and $NaBH_4$ in the presence of a complexing ether solvent to produce TMDS and a BH_3.ether complex, and

(b) adding incrementally additional substoichiometric amounts of NaH to the reaction mixture obtained from step (a) to react with the BH_3.ether complex to produce $NaBH_4$, and

(c) allowing the thus-formed $NaBH_4$ to react in situ with the remaining TMDCDS to produce TMDS and a BH_3.ether complex, and

(d) continuing the sequence of steps (b) and (c) until fully stoichiometric amounts of NaH have been added to the reaction mixture of step (a), so as to complete the reaction converting TMDCDS to TMDS, and

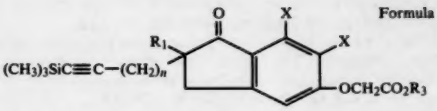
(e) separating and recovering the thus-formed TMDS and recovering and recycling the ether solvent and the unreacted NaH and $NaBH_4$ reactants.

4,291,168
SILYLATED INDANYLOXYACETATES

Porter C. Johnson, Evansville, Ind., and William L. Matier, Libertyville, Ill., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 27,961, Apr. 9, 1979, Pat. No. 4,247,715. This application Sep. 24, 1980, Ser. No. 190,159
Int. Cl.³ C07F *7/08, 7/04*
U.S. Cl. 556—441 **7 Claims**

1. A silylated compound of Formula IV



Formula IV

wherein

n is 1 or 2;

X is halo;

R_1 is phenyl or p-halophenyl; and

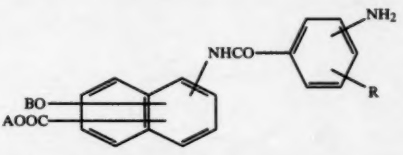
R_3 is lower alkyl.

4,291,169
SUBSTITUTED NAPHTHOIC ACIDS

Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 118,006, Feb. 4, 1980. This application Dec. 10, 1980, Ser. No. 214,914
Int. Cl.³ C07C *103/84*
U.S. Cl. 560—45 **4 Claims**

1. A compound of the formula:



wherein A is selected from the group consisting of hydrogen, lower (C_1–C_6)alkyl and a pharmaceutically acceptable salt cation; B is selected from the group consisting of hydrogen, lower (C_1–C_6)alkanoyl and a pharmaceutically acceptable salt cation; and R is selected from the group consisting of hydrogen and lower (C_1–C_3)alkyl.

4,291,170
PREPARATION OF DELTA-KETO-ESTERS

Sijbrandus E. Schaafsma, Beek; Johannes H. A. Hofman, Maastricht, and Johannes E. L. Claassens, Heerlen, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 413,436, Nov. 7, 1973, abandoned. This application May 20, 1977, Ser. No. 798,888
Claims priority, application Netherlands, Nov. 11, 1972, 7215305
Int. Cl.³ C07C *67/313*
U.S. Cl. 560—126 **9 Claims**

1. Process for the preparation of a delta-keto-ester comprising reacting together in the liquid phase at a temperature of about 75° to 250° C. of an ester of an alpha-beta unsaturated carboxylic acid derived from acids having from 3 to 8 carbon atoms with a ketone having 3 to 10 carbon atoms, provided that said ketone has at least one hydrogen atom in the alpha position thereof, in the presence of primary amine containing from 1 to 6 carbon atoms, a Schiff base of said amine, or both, and an acid compound to form the corresponding delta-keto-ester.

4,291,171
ESTERS OF 2-FLUORO-2,2-DINITROETHYLMALONATE AND 2,2-DINITROPROPYLMALONATE

Kurt Baum, Pasadena, and Allen M. Guest, San Dimas, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1980, Ser. No. 179,863
Int. Cl.³ C07C *79/41*
U.S. Cl. 560—156 **4 Claims**

1. The compound, dimethyl 2-fluoro-2,2-dinitroethylmalonate.

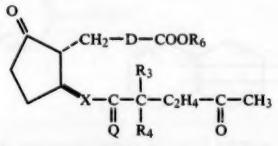
3. The compound, dimethyl 2,2-dinitropropylmalonate.

4,291,172
13,14-DIHYDRO-INTER-OXA-11-DEOXY-19-OXO-PGE$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,040
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



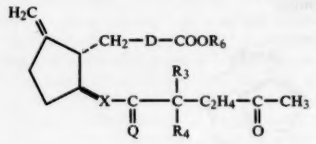
wherein D is
(1) $(CH_2)_3—O—CH_2—$,
(2) $(CH_2)_2—O—(CH)CH_2—$, or
(3) $—CH_2—O—(CH_2)_3—$,
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) $—(p—Ph)—CO—CH_3$,
(h) $—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3$,
(i) $—(p—Ph)—NH—CO—(p—Ph)$,
(j) $—(p—Ph)—NH—CO—CH_3$,
(k) $—(p—Ph)—NH—CO—NH_2$,
(l) $—(p—Ph)—CH=N—NH—CO—NH_2$,
(m) β-naphthyl,
(n) $—CH_2—CO—R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is $—CH_2CH_2—$.

4,291,173
13,14-DIHYDRO-INTER-OXA-11-DEOXY-9-DEOXY-9-METHYLENE-19-OXO-PFG$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,061
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



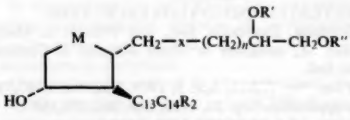
wherein D is
(1) $(CH_2)_3—O—CH_2—$,
(2) $(CH_2)_2—O—(CH_2)CH_2—$, or
(3) $—CH_2—O—(CH_2)_3—$,
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogn or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inslusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) $—(p—Ph)—CO—CH_3$,
(h) $—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3$,
(i) $—(p—Ph)—NH—CO—(p—Ph)$,
(j) $—(p—Ph)—NH—CO—CH_3$,
(k) $—(p—Ph)—NH—CO—NH_2$,
(l) $—(p—Ph)—CH=N—NH—CO—NH_2$,
(m) β-naphthyl,
(n) $—CH_2—CO—R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptble cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 fluoro only when the other is hydrogen or fluoro; and
wherein X is $—CH_2CH_2—$.

4,291,174
1-HYDROXYMETHYL-15-HYDROXY-PROSTEN-1-OL DERIVATIVES

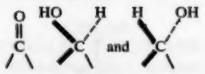
Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 3, 1980, Ser. No. 137,050
Int. Cl.³ C07C *49/597, 35/06, 49/798*
U.S. Cl. 568—330 **60 Claims**

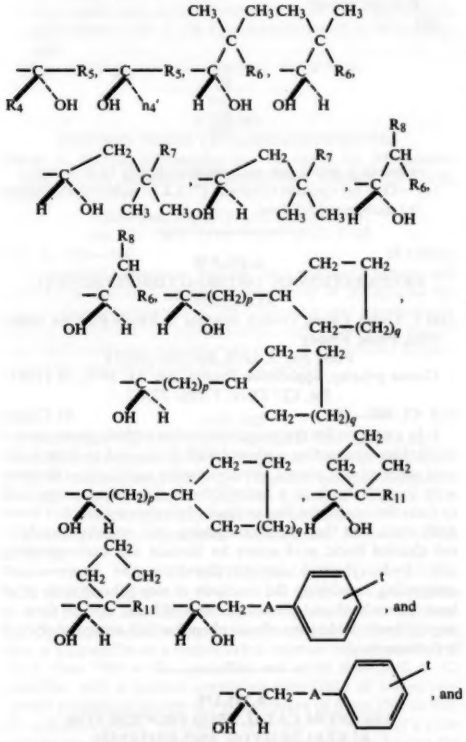
1. Compounds of the formula:



n is the integer 3-5 inclusive;
wherein M is the divalent moiety selected from the group



X is —CH=CH—(trans) and —CH=CH—(cis); R′ and R″ are the same or different and are hydrogen, C_1 to C_4 alkyl, C_1 to C_6 alkanoyl or optionally substituted benzoyl, the substituents selected from the group C_1 to C_4 alkoxy, halo and trifluoromethyl; C_{13}–C_{14} is selected from the group —CH=CH—(trans) and —CH_2CH_2—; and R_2 is selected from the group



wherein R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4–C_7 alkyl; R_6 is selected from the group consisting of C_3–C_6 alkyl; R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; A is a divalent radical selected from —CH_2— and —O—; p is an integer from o to 3; q is the integer 1 or 2; t is selected from the consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl and methoxy; and n is the integer 3, 4 or 5.

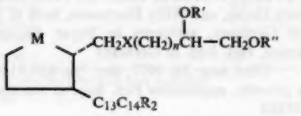
4,291,175

1-HYDROXYMETHYL-11-DEOXY-15-HYDROXY-PROSTEN-1-OL-DERIVATIVES

Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

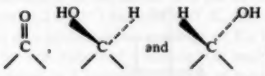
Filed Apr. 3, 1980, Ser. No. 137,082
Int. Cl.[3] C07C 35/06, 49/597, 49/798
U.S. Cl. 568—330 18 Claims

1. A compound of the formula



wherein

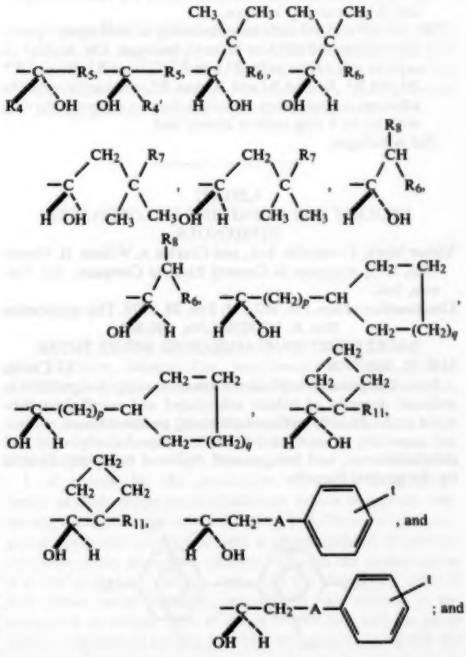
M is a radical selected from the group



X is —CH_2CH_2—;

R′ and R″ are the same or different and are hydrogen, C_1 to C_4 alkanoyl or optionally substututed benzoyl, the substituents selected from the group C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo and trifluoromethyl;

$C_{13}C_{14}$ is selected from the group —CH=CH—(trans) and —CH_2—CH_2—; and R_2 is selected from the group



wherein R_4 is hydrogen or methyl; R_5 is selected from the group consisting of C_4–C_7 alkyl; R_6 is selected from the group consisting of C_3–C_6 alkyl; R_7 is selected from the

group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; A is a divalent radical selected from —CH_2— and —O—; p is an integer from o to 3; q is the integer 1 or 2; t is selected from the consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl and methoxy; and n is the integer 3, 4 or 5.

4,291,176

PRODUCTION OF INSECTICIDALLY ACTIVE VINYL-CYCLOPROPANE CARBOXYLIC ACID ESTERS

Hans-Georg Heine, and Willy Hartmann, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

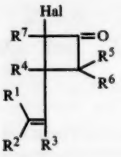
Filed Aug. 24, 1977, Ser. No. 827,514

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638356

Int. Cl.[3] **C07C** *49/27, 49/533, 49/45, 49/54, 49/80*

U.S. Cl. 568—381 **7 Claims**

1. An α-halogenocyclobutanone of the formula



(II)

in which

R^1, R^2 and R^3 each independently is hydrogen, halogen, CN, optionally substituted alkyl or alkenyl, aralkyl, aryl, alkoxycarbonyl, alkylsulphonyl, arylsulphonyl, acyloxy or dialkylaminocarbonyl, at least one of the radicals R^1, R^2 and R^3 containing halogen,

R^4, R^5, R^6 and R^7 each independently is hydrogen, optionally substituted alkyl or alkenyl, halogen, CN, aralkyl or aryl, or any of the pairs R^1 and R^2, R^2 and R^3, R^1 and R^4, R^4 and R^5, R^4 and R^7 and R^5 and R^6, conjointly with the adjacent carbon atom or atoms form a carbocyclic ring with up to 8 ring carbon atoms, and

Hal is halogen.

4,291,177

PROCESS FOR OBTAINING HALOGENATED DIPHENOLS

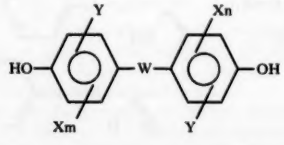
Victor Mark, Evansville, Ind., and Charles A. Wilson, II, Greenville, S.C., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 882,191, Feb. 28, 1978. This application Dec. 6, 1979, Ser. No. 100,864

Int. Cl.[3] **C07C** *39/16, 43/23, 39/00, 147/10, 147/14*

U.S. Cl. 568—726 **13 Claims**

1. A halogenated diphenol mixture having a significantly reduced quantity of trihalo substituted and tetrahalo substituted diphenol, said mixture containing predetermined, statistical quantities of unreacted diphenol, monohalodiphenol and dihalodiphenol, said halogenated diphenol being represented by the general formula:



wherein Xm and Xn are each independently a halogen and mixtures thereof; Y is independently selected from the group consisting of C_1–C_4 alkyl and hydrogen; m and n are each 0–2 with the proviso that m+n equal at least 0.1, but more than 2.0; and, W is a member selected from the following group:

(a) $-(CH_2)_r-$, wherein r is 0–10 with the proviso that when both Xm and Xn are chlorine and m and n are each 1, r is 0 or 2–10;

(b)

wherein R is a member of the group consisting of C_1–C_{10} alkyl and C_6–C_{14} aryl;

(c)

wherein R and R′ can each independently be the same as R in (b) above;

(d)

wherein p and q can each independently be 0–1; and,

(e) —O— (e) cyclohexylidene; (f) 2,2,2-trichloroethylidene; (h) dichlorovinylidene.

4,291,178

PREPARATION OF ORTHO-HYDROXYBENZYL ALCOHOLS

Joël L. Ludec, Lyons, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jul. 5, 1979, Ser. No. 55,071

Claims priority, application France, Jul. 11, 1979, 78 21591

Int. Cl.[3] **C07C** *37/00, 27/00*

U.S. Cl. 568—764 **14 Claims**

1. In a process for the preparation of an orthohydroxybenzyl alcohol by (a) reacting a phenol with boric acid to form boric acid esters of said phenol, (b) condensing said boric acid esters with formaldehyde or a formaldehyde-generating compound to form the corresponding ortho-hydroxybenzyl alcohol boric acid esters, and then (c) decomposing said orthohydroxybenzyl alcohol boric acid esters to liberate the corresponding ortho-hydroxybenzyl alcohol therefrom the improvement comprising employing the reactants in step (a) in a ratio of at least 1.1 mols of said phenol per mol of boric acid to form in step (a) boric acid esters of said phenol which comprise phenol orthoborates.

4,291,179

RHODIUM CATALYZED PROCESS FOR ACETALDEHYDE AND ETHANOL

Richard W. Goetz; Lawrence D. Meixsel, and David W. Smith, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,285

Int. Cl.[3] **C07C** *29/14, 31/08, 47/06*

U.S. Cl. 568—882 **17 Claims**

1. A process which comprises reacting formaldehyde, carbon monoxide and hydrogen in a solvent comprising an aprotic organic amide at a temperature of from about 75° to about 250° C. and superatmospheric pressure to form acetaldehyde in a first reaction stage and then etha..ol in a second reaction stage,

wherein a catalyst system initially comprised of a source of rhodium and a source of halide is present at least during said first reaction stage and wherein said second reaction stage is carried out in the presence of hydrogen, a hydrogenation catalyst and under sufficient conditions of temperature and pressure to effect hydrogenation.

4,291,180

CO-PRODUCTION OF INDENE AND STYRENE

Oliver A. Kiikka, Willoughby, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 107,963
Int. Cl.[3] C07C *5/42, 5/367, 4/12, 5/48*
U.S. Cl. 585—320 **8 Claims**

1. A process for co-production of indene and styrene from a mixture of cyclopentadiene or dicyclopentadiene and butadiene which comprises the steps of

(a) reacting cyclopentadiene, dicyclopentadiene or mixtures thereof with butadiene at an elevated temperature pressure to form a mixture comprising tetrahydroindene, vinylcyclohexene and vinylnorbornene,

(b) recovering the tetrahydroindene and vinylcyclohexene,

(c) contacting the mixture of tetrahydroindene and vinylcyclohexene with an oxygen donor and a catalyst comprising cobalt oxide and molybdenum oxide at a temperature above about 300° C. for a period of from 0.1 to 30 seconds, and

(d) recovering a mixture of indene and styrene.

4,291,181

INDENES FROM TETRAHYDROINDENES

Oliver A. Kiikka, Willoughby, and George S. Li, Macedonia, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 108,258
Int. Cl.[3] C07C *5/42, 5/367, 4/12, 5/48*
U.S. Cl. 585—320 **15 Claims**

1. A dehydrogenation process for producing indene and substituted indenes from tetrahydroindene or substituted tetrahydroindene which comprises contacting said tetrahydroindene or substituted tetrahydroindene with a catalyst comprising cobalt oxide and molybdenum oxide at an elevated temperature for a period of from 0.1 to 30 seconds.

4,291,182

PROCESS FOR THE PREPARATION OF AROMATIC HYDROCARBONS AND HYDROGEN FROM BUTANE

Frits M. Dautzenberg, and Nigel Wagstaff, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 11, 1980, Ser. No. 129,446
Claims priority, application Netherlands, Mar. 14, 1979, 7902018
Int. Cl.[3] C07C *2/76, 15/02*
U.S. Cl. 585—415 **5 Claims**

1. A process for the preparation of aromatic hydrocarbons and hydrogen, which comprises contacting in a contact zone as feed a C_4 paraffin or a hydrocarbon mixture which consists of more than 75% w C_4– paraffins and more than 50% w C_4 paraffins with a catalyst consisting essentially of a zinc-promoted crystalline silicate at a temperature of from 350° to 700° C., a space velocity of from 0.1 to 20 $g.g^{-1}.h^{-1}$ and at a pressure below 5 bar, which silicate is characterized as having the following properties after 1 hour's calcining in air at 500° C.:

(a) thermally stable up to a temperature above 600° C.,

(b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A.

TABLE A

Radiation: Cu-K 2 θ	Wavelength 0.15418 nm relative intensity
7.8–8.2	S
8.7–9.1	M

TABLE A-continued

Radiation: Cu-K 2 θ	Wavelength 0.15418 nm relative intensity
11.8–12.1	W
12.4–12.7	W
14.6–14.9	W
15.4–15.7	W
15.8–16.1	W
17.6–17.9	W
19.2–19.5	W
20.2–20.6	W
20.7–21.1	W
23.1–23.4	VS
23.8–24.1	VS
24.2–24.8	S
29.7–30.1	M

wherein the letters used have the following meanings:
VS = very strong;
S = strong;
M = moderate;
W = weak;
θ = angle according to Bragg's law.

(c) after conversion of the silcate into the H-form and after evacuation at 2×10^{-9} bar and 400° C. for 16 hours and measured at a hydrocarbon pressure of 8×10^{-2} bar and 100° C., the adsorption of n-hexane is at least 0.8 mmol/g, the adsorption of 2,2-dimethylbutane at least 0.5 mmol/g and the ratio

$$\frac{\text{absorption of n-hexane}}{\text{absorption of 2,2-dimethylbutane}} \text{ at least 1.5,}$$

(d) the composition, expressed in moles of the oxides, is as follows:

$$y(1.0\pm0.3)M_{n/2}O.y.Al_2O_3.SiO_2$$

wherein M = H and/or alkali metal and/or alkaline-earth metal, n is the valency of M and $0.0065 < y \leqq 0.0017$; said catalyst containing 0.05 to 20% w zinc and withdrawing an aromatic hydrocarbon mixture and a hydrogen-containing gaseous mixture from said contact zone.

4,291,183

PRODUCTION OF TERTIARY-BUTYLSTYRENE

Glen F. Crum, Odessa, Tex., and Samuel J. Paton, Wilaya D'Oran, Algeria, assignors to El Paso Products Company, Odessa, Tex.

Filed Jan. 29, 1980, Ser. No. 116,657
Int. Cl.[3] C07C *5/48*
U.S. Cl. 585—443 **6 Claims**

1. A process for the production of tertiary-butylstyrene under oxydehydrogenation conditions which comprises contacting a feed mixture of tertiary-butylethylbenzene and oxygen at moderate conditions with a coprecipitated aluminum-calcium-cerium phosphate catalyst, wherein the cerium metal is in the plus three valence state, and the aluminum, calcium and cerium metal elements, respectively, are present in the catalyst in an atomic ratio of about 5–20:5–20:1 and the phosphate component is present in a sufficient quantity to satisfy the valences of the metal elements, and wherein the selectivity to tertiary-butylstyrene is at least 80 mole percent, and the selectivity to dialkenylbenzene is essentially zero mole percent.

4,291,184
PROCESS FOR PRODUCING TERTIARY-BUTYLSTYRENE

Glen F. Crum, Odessa, Tex., and Samuel J. Paton, Wilaya D'Oran, Algeria, assignors to El Paso Products Company, Odessa, Tex.

Filed Jan. 29, 1980, Ser. No. 116,658
Int. Cl.[3] C07C *5/48*
U.S. Cl. 585—443 5 Claims

1. A process for the production of tertiary-butylstyrene under moderate oxydehydrogenation conditions which comprises contacting a feed mixture of tertiary-butylethylbenzene and oxygen with a coprecipitated nickel-zirconium-cerium phosphate catalyst, wherein the cerium metal is in the plus three valence state, and the nickel, zirconium and cerium metal elements, respectively, are present in the catalyst in an atomic ratio of about 5–20:1:1 and the phosphate component is present in a sufficient quantity to satisfy the valences of the metal elements, and wherein the conversion selectivity to tertiary-butylstyrene is at least 80 mole percent, and the conversion selectivity to divinylbenzene is essentially zero mole percent.

4,291,185
ALKYLATION OF BENZENE IN PETROLEUM

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 969,626, Dec. 14, 1978. This application Aug. 8, 1979, Ser. No. 64,962
Int. Cl.[3] C07C *2/68*
U.S. Cl. 585—467 8 Claims

1. A process for the selective reaction of benzene relative to toluene in hydrocarbon mixtures comprising benzene, toluene and other aliphatic and aromatic hydrocarbons, said selective conversion process comprising contacting said hydrocarbon mixture with propylene, at a temperature of between about 100° C. and the critical temperature of the benzene reactant at a pressure of between about 10^5 N/m^2 and about 6×10^6 N/m^2, in the presence of a selective catalyst comprising ZSM-12 zeolites.

5. A process for upgrading motor fuels containing benzene therein, said process comprising contacting said motor fuel with propylene, at a temperature of between about 100° C. and the critical temperature of said benzene and a pressure of between about 10^5 N/m^2 and 6×10^6 N/m^2, in the presence of a crystalline zeolite comprising ZSM-12.

4,291,186
TRANSALKYLATION PROCESS

Hosheng Tu, Shorewood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 13, 1980, Ser. No. 129,940
Int. Cl.[3] C07C *5/22*
U.S. Cl. 585—475 2 Claims

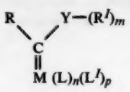
1. A transalkylation process which comprises contacting toluene at transalkylation conditions including a temperature in the range of from about 400° C. to about 520° C., a pressure in the range of from about atmospheric to about 100 atmospheres, a hydrogen to hydrocarbon mole ratio of from about 2:1 to about 20:1 with a catalyst consisting essentially of mordenite, alumina and arsenic.

4,291,187
OLEFIN DISPROPORTIONATION PROCESS

Dennis S. Banasiak, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 57,246, Jul. 11, 1979, Pat. No. 4,247,417. This application Sep. 5, 1980, Ser. No. 184,551
Int. Cl.[3] C07C *6/00*
U.S. Cl. 585—644 22 Claims

1. A process for the disproportionation of olefins comprising contacting at least two suitable non-conjugated olefinic reactants under suitable reaction conditions with a catalytic amount of a catalyst composition consisting essentially of (1) at least one neutral carbene complex having the general formula



wherein R is an aryl or substituted aryl radical containing 6 to 30 carbon atoms per radical wherein the substituted aryl radical can have one or more substituents each of which can be the same or different and selected from the group consisting of halides, alkoxides and alkyl radicals containing 1 to 20 carbon atoms per radical; R^I is selected from the group consisting of alkyl, cycloalkyl, aryl, substituted aryl, trialkylsilyl, and triarylsilyl radicals containing 1 to 30 carbon atoms per radical with the aryl substituents being the same as for the sustituted aryl of R; Y is 0, Se, S, N, or P; m is 1 when Y is 0, Se, or S and 2 when Y is N or P; M is tungsten or rhenium; each L is individually selected from CO, NO, PF_3, PCl_3, or pyridine; L^I is cyclopentadienyl or allyl; p is 0 or 1; and n is 5 when p is 0 or 2 when p is 1, and

(2) at least one activator selcted from chlorinated or chlorobrominated saturated organic compound having 1 to 20 carbon atoms per molecule and containing only carbon and chlorine or carbon, chlorine, and bromine.

4,291,188
PROCESS FOR THE PREPARATION OF METHANE AND/OR ETHANE

Nigel Wagstaff, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 11, 1980, Ser. No. 129,445
Claims priority, application Netherlands, Mar. 14, 1979, 7902021
Int. Cl.[3] C07C *4/02*
U.S. Cl. 585—752 9 Claims

1. A process for the preparation of methane and/or ethane, which comprises contacting as feed a C_{2-4} paraffin or a hydrocarbon mixture which consists of more than 75% C_{2-4} paraffins and which C_{2-4} paraffins have an average molar carbon number which is at least 0.5 higher than that of the C_2^- paraffin fraction of the product, at an elevated temperature of from 400° to 800° C., a pressure of above 10 to below 100 bar, and a space velocity of from 0.1 to 20 $g.g^{-1}.h^{-1}$ in a contact zone with a crystalline silicate as the catalyst, which silicate is characterized in that after 1 hour's calcining in air at 500° C. it has the following properties:

(a) thermally stable up to a temperature above 600° C.,

(b) an X-ray powder diffraction pattern showing, inter alia, the reflections give in Table A.

TABLE A

Radiation : Cu—K 2 θ	Wavelength 0.15418 nm relative intensity
7.8–8.2	S
8.7–9.1	M
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15.4–15.7	W
15.8–16.1	W
17.6–17.9	W
19.2–19.5	W
20.2–20.6	W
20.7–21.1	W
23.1–23.4	VS
23.8–24.1	VS
24.2–24.8	S
29.7–30.1	M

wherein the letters used have the following meanings:

VS=very strong; S=strong; M=moderate; W=weak; θ=angle according to Bragg.

(c) after conversion of the silicate into the H-form and after evacuation at 2×10^{-9} bar and 400° C. for 16 hours and measured at a hydrocarbon pressure of 8×10^{-2} bar and 100° C. the adsorption of n-hexane is at least 0.8 mmol/g, the adsorption of 2,2-dimethylbutane at least 0.5 mmol/g and the ratio

$$\frac{\text{adsorption of n-hexane}}{\text{adsorption of 2,2-dimethylbutane}} \text{ at least 1.5,}$$

(d) the composition, expressed in moles of the oxides, is as follows:

$y.(1.0\pm0.3)M_{n/2}O.y.Al_2O_3.SiO_2$

wherein M=H and/or alkali metal and/or alkaline-earth metal, n is the valency of M and $y \geqq 0.01$; and withdrawing a methane and ethane containing product from said catalyst zone.

4,291,189

ALKYLATION PROCESS IMPROVEMENT

David B. Bishkin, Houston, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 28, 1980, Ser. No. 144,733

Int. Cl.³ C07C 7/00

U.S. Cl. 585—860 **7 Claims**

1. A method of neutralizing and rendering entrained phosphoric acid soluble in isopropylbenzene alkylate comprising addition to said alkylate and said entrained phosphoric acid in amount of a primary amine effective to neutralize and render said phosphoric acid soluble.

4,291,190

FLUID-COOLED HOLDER FOR AN ELECTRODE TIP

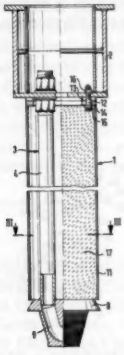
Emil Elsner; Rudolf Kasper, both of Baden-Baden, Fed. Rep. of Germany, and William E. Schwabe, Middleburg Heights, Ohio, assignors to Korf & Fuchs Systemtechnik GmbH, Willstadt-Legel-shurst, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,144

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845367

Int. Cl.[3] H05B *7/06*

U.S. Cl. 13—18 R 16 Claims



1. A fluid-cooled holder for the tip of an electrode of an electric arc smelting furnace, comprising: a holding portion adapted to be secured to an electrode support arm, a metal cooling system for cooling said electrode and for carrying electrode current, said cooling system being secured to said holding portion and having a free-end carrying a screw-threaded portion for screwing on the electrode tip, an electrically insulating refractory substance surrounding said cooling system, and a metal tube snuggly fitting around said substance and being electrically insulated with respect to said cooling system, said refractory substance being sufficiently thermally conductive so that the temperature of the metal tube is kept to a value below the softening temperature of the material of the metal tube upon insertion of said holder in an electric arc smelting furnace.

4,291,191

SOLAR CELL ARRANGEMENT

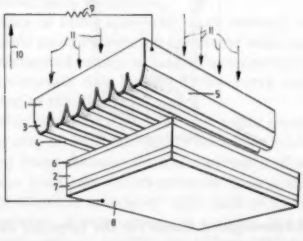
Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,108

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926754

Int. Cl.[3] H01L *31/06*

U.S. Cl. 136—246 18 Claims



1. A solar cell arrangement, in which two separate plates or discs are provided; one plate or disc comprises light-transmissive material; one side of this plate or disc has a regular structure of light-transmissive elevations which taper parabolically; these parabolic elevations are cut off parallel to the surface of the plate or disc at the level of their focal points or lines; the surface of the parabolic elevations is coated with an at least partially light-transmissive, electrically conductive layer; the second plate or disc of the arrangement comprises semiconductor or metallically conductive material; and both plates or discs are assembled mechanically so that the cut off surfaces of the parabolic elevations form photovoltaic or non-blocking electrical contacts with the surface of the semiconductor or metallically conductive plate or disc so that light which passes through the light-transmissive plate or disc is concentrated at the contacts.

4,291,192

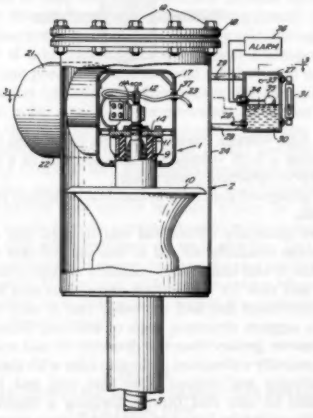
VENTING APPARATUS FOR AN ELECTRIC CABLE POTHEAD

Thomas F. Eccleston, Jeanette, and Walter M. Wilson, Greensburg, both of Pa., assignors to Consolidated Edison Company of New York, Inc., New York, N.Y.

Filed May 1, 1980, Ser. No. 145,592

Int. Cl.[3] H02G *15/22*

U.S. Cl. 174—11 BH 16 Claims



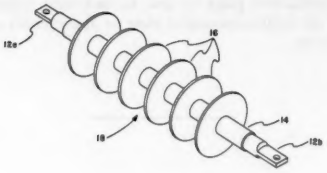
1. In combination with a housing enclosing a portion of an electrical cable which operates at a predetermined voltage which is different from the voltage of said housing, said cable having fluid under pressure above atmospheric pressure therein, venting means for venting fluid from said cable exteriorly of said housing, said venting means comprising a tube of insulating material connected in fluid communication with a portion of said cable at said predetermined voltage and extending to at least a wall of said housing for conveying fluid out of said cable and to the outside of said housing, a closed reservoir externally of said housing and connected to said tube for receiving fluid from said cable, and means connected to said reservoir for venting said fluid from said reservoir, said tube having a length and being made of an insulating material which has physical and electrical properties which will withstand the pressure of said fluid and withstand said voltage without breakdown.

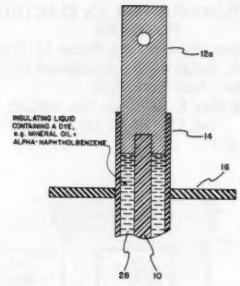
4,291,193

SELF-MONITORING HIGH VOLTAGE TRANSMISSION LINE SUSPENSION INSULATOR

Gary E. Stemler, and Donald N. Scott, both of Vancouver, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,322
Int. Cl.[3] H01B *17/02, 17/34, 17/36*
U.S. Cl. 174—11 R **2 Claims**





1. A high voltage transmission line suspension insulator for connecting a high voltage transmission line to a transmission line support structure comprising:

a. an elongated generally cylindrical dielectric rod with two ends;

b. two generally cylindrical end fittings, one of said end fittings coaxially affixed to one end of said rod and the other of said end fittings coaxially affixed to the other end of said rod, for connecting one end to said high voltage transmission line and the other end to said transmission line support structure, each of said end fittings having a diameter greater than the diameter of said rod;

c. a generally cylindrical dielectric tube with sheds, said tube enclosing and spaced from said rod and hermetically sealed to said end fittings forming a liquidtight space within said tube between said end fittings around said rod;

d. a pressurized dielectric liquid disposed within said space; and

e. a non-ionic organic discoloring dye disposed in said space for detecting loss of pressurized liquid from said space.

4,291,194

NEGATIVE CORONA SHIELDING OF LINE AND STATION HARDWARE

Olaf Nigol, Etobicoke; Herbert J. Houston, Oakville, and Adolf Gretzinger, Ancaster, all of Canada, assignors to Slater Steel Industries Limited, Hamilton, Canada

Filed Jul. 10, 1979, Ser. No. 56,203
Int. Cl.[3] H02G *7/05;* **H01T** *19/00;* **H01B** *17/42*
U.S. Cl. 174—40 R **6 Claims**

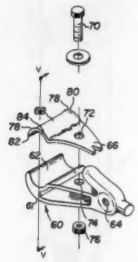
1. A clamp for use with a conductor comprising:

a body member having an axially extending arcuate-shaped recess formed therein for receiving the conductor;

a clamping member having an axially extending arcuate-shaped recess formed therein cooperating with the recess in the body member to clamp the conductor and an external surface having a first portion thereof shaped and structured to generate a localized increase in voltage gradient thereon;

means for interconnecting said body member and said clamping member; and

shielding means including convergent surfaces intersecting to define a sharp edge adjacent an end of the recess in one of the clamping member and body member to promote a negative corona discharge adjacent said first portion, said sharp edge being located in a plane extending perpendicular to the axis of one of the recesses, whereby said negative



corona discharge produces a positive space charge to reduce said voltage gradient at said first portion.

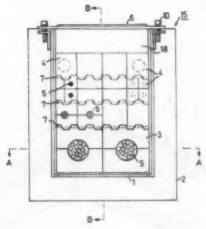
6. A method of inhibiting positive corona discharge from a portion of one side of an external surface of a conductor clamp having an axially extending recess formed therein, said portion being shaped and structured to generate a localized increase in voltage gradient thereon, comprising the step of providing shielding means on said one side of said clamp for promoting negative corona discharge adjacent said portion, said shielding means having convergent surfaces intersecting to define a sharp edge so as to produce a positive space charge to thereby reduce the voltage gradient at said portion, the sharp edge being located in a plane extending substantially perpendicular to the axis of the recess.

4,291,195

LEAD-THROUGH FOR THE FIREPROOF DISPOSITION OF ELECTRIC CABLES THROUGH A WALL

John-Erik V. Blomqvist, and Erik M. Blomqvist, both of Karlskrona, Sweden, assignors to AB Lyckeaborgs Bruk, Karlskrona, Sweden

Filed Nov. 15, 1979, Ser. No. 94,477
Claims priority, application Sweden, Jan. 18, 1979, 7900463
Int. Cl.[3] H02G *3/22*
U.S. Cl. 174—48 **16 Claims**



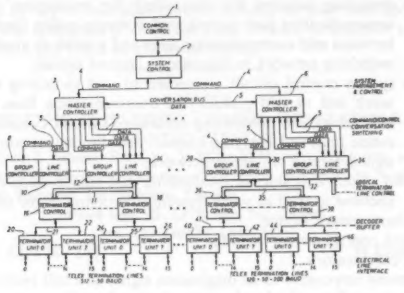
1. A lead-through or transit for the fireproof disposition of electric cables through an opening in a wall or the like, comprising a metal frame the opening of which accommodates the cables and modularly dimensioned blocks surrounding each

cable, as well as stay strips inserted between rows of blocks for stiffening the pack formed by the blocks, characterized in that the frame is formed by at least one frame half which is fitted on one side of the wall directly opposite the opening in said wall, the frame half on at least three sides comprising comparatively thin metal plate or sheet, extending substantially perpendicular to the wall and including a profiled portion in the form of a channel or trough, which has its longitudinal axis substantially parallel to the edge of the sheet remote from the wall, said portion extending towards the wall from the vicinity of this edge, with its bottom in a plane outside the non-profiled portion of the frame half side, while the fourth side of the frame half is formed by at least one pressure plate bearing against the blocks in the transit, said plate having the same profile as the channel-like portions of the other three sides along its edge portion remote from the wall, and that the opening in the frame half is filled with blocks and throughgoing cables such that the appropriate sides of peripheral blocks engage against the bottoms of said channels formed by said profiled portions.

4,291,196
CIRCUIT FOR HANDLING CONVERSATION DATA IN A DISTRIBUTED PROCESSING TELEX EXCHANGE

John W. Spaniol, Studio City, Calif.; John J. Bowerman, Rock Ridge, Md., and Marvin Perlman, Granada Hills, Calif., assignors to Frederick Electronics Corp., Frederick, Md.

Filed Nov. 6, 1979, Ser. No. 92,424
Int. Cl.³ H04L *11/00*; H04Q *3/54*
U.S. Cl. 178—3 **9 Claims**



1. For use in a distributed procesing telex exchange in which the customer terminations connected to the exchange are divided into a predetermined number of groups having a predetermined number of terminations in each group and where each call to or from each termination involves the handling or serialized conversation data bits, a circuit for enabling the systematic handling of the conversation data from a calling party to a called party comprising:

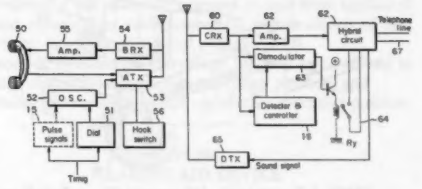
(a) a plurality of frame memories, each memory having an addressable memory location associated with each termination connected to the exchange, for temporarily storing the conversation data generated by every termination connected to the exchange; and

(b) a plurality of vector memories, one vector memory from said plurality of vector memories associated with a corresponding frame memory from said plurality of said frame memories, each said vector memory having addressable memory locations associated with each of the predetermined number of terminations in a group, for storing in each vector memory location the address within its associated frame memory of the conversation data to be forwarded to the termination within the group that corresponds to the vector memory address.

4,291,197
REMOTE TELEPHONE SYSTEM

Yoshifumi Yonaga, Tokyo, Japan, assignor to Maruyoshi Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1979, Ser. No. 44,069
Claims priority, application Japan, May 31, 1978, 53-64221; Aug. 22, 1978, 53-101413
Int. Cl.³ H04Q *7/04*
U.S. Cl. 179—2 EA **8 Claims**



1. A remote telephone system comprising a remote station having a remote transmitter and receiver means, and a base station having a base transmitter and receiver means, wherein said remote station includes pulse code means for generating a pulse signal corresponding to at least one predetermined decimal number, said remote transmitter means transmitting said pulse signal to said base radio station, and said base receiver means receiving said transmitted pulse signal, and wherein said base radio station includes discriminator means, coupled to said base receiver means, for determining if said pulse signal corresponds to said at least one predetermined decimal number, a dialing signal demodulator means, and enabling means, responsive to said discriminator means, for enabling said dialing signal demodulator if said transmitted pulse signal corresponds to said at least one predetermined decimal number, and wherein said base station includes counter means for counting the pulses in said pulse signal and for providing an output corresponding to the number of pulses counted; and gate means having one input coupled to the output of said counter means corresponding to said at least one predetermined decimal number and another input coupled to said dial signal demodulator means, whereinsaid base station includes means for disabling said counter means after its response to said pulse signal corresponding to said predetermined decimal number, and means for resetting said counter means in response to a carrier signal from said remote station and wherein the output of said gate means is coupled to a dialing relay means for controlling the opening and closing thereof.

4,291,198
GENERAL-PURPOSE ELECTRONIC TELEPHONE STATION SET

Robert V. Anderson, Westfield; Douglas L. Bayer, Somerset; David W. Hagelbarger, Morris Township, Morris County, and Peter S. Kubik, South Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 28, 1979, Ser. No. 53,099
Int. Cl.³ H04M *11/08, 1/02*
U.S. Cl. 179—2 DP **25 Claims**

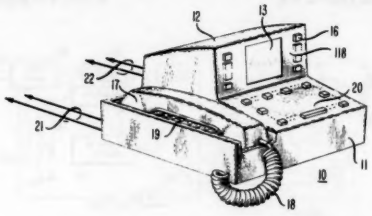
1. A general-purpose electronic telephone station set for use in conjunction with a host computer (40) and having plural user-controllable operations, said set including transducers (17) for audio input/output of received or transmitted signal information, a display screen (13) for video output of information, a keyboard (20) including a plurality of keys for manual input of signal information, and data processing means (43) for electrically intercoupling the keyboard, the screen, and the transducers for programmable interaction, the improvement comprising

plural function keys (16) arrayed along at least one side of the screen in positions corresponding to different line positions on the screen, said function keys being coupled

to said data processing means for inclusion in said programmable interaction, and

said data processing means including

means, responsive to signals from said host computer, for displaying in text on said screen an initial set (**140**) of user-selectable choices of station set operations, such choices including at least one called station calling mode (CALL BY TYPING),



means, responsive to actuation of at least one of said function keys, for sending to said host computer signals identifying such one key, and

means, responsive to signals from said host computer directing the one of said calling modes corresponding to the identified function key, to produce signals identifying said called station.

4,291,199

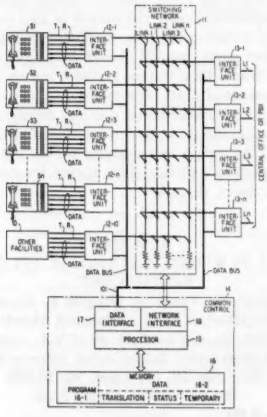
COMMUNICATION SYSTEM TRACKING ARRANGEMENT

Wayne Densmore, Eatontown, and Thomas M. Quinn, Little Silver, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1979, Ser. No. 24,724

Int. Cl.[3] **H04M** *1/22, 3/22, 3/42*

U.S. Cl. 179—18 AB **23 Claims**



1. A station tracking control arrangement for use in a communication system having a plurality of stations having communication capability among each other over communication links, said arrangement comprising

means for determining the busy-idle status of each said station,

means controlled from a first station for temporarily establishing in association with said first station a selected other station as a target station,

means separate from said communication links for providing a first indication at said first station when said target station is busy, and

means separate from said communication links for providing a second indication at said first station when said target station is idle.

4,291,200

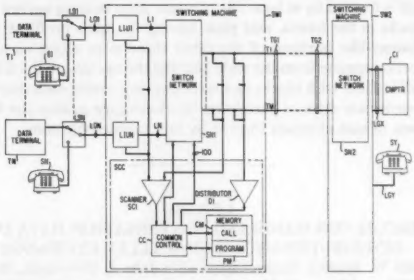
VOICE AND DATA SWITCHING ARRANGEMENT

Nicholas K. Smith, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1979, Ser. No. 89,769

Int. Cl.[3] **H04M** *3/58*

U.S. Cl. 179—18 BD **13 Claims**



1. A telecommunications system for providing data transmission on each of a plurality of communication lines having subscriber apparatus connected thereto, said telecommunication system comprising:

a switching network for controlling the connection of a communication path among said communication lines or between said communication lines and a trunk to another switching network in response to control signals;

a system control circuit connected to said switching network and to said plurality of communication lines for monitoring and controlling conditions on said communication lines and applying connect and disconnect control signals to said switching network;

said system operable for establishing data transmission connections as well as voice transmission connections, and

characterized in that

said control circuit includes

a call memory,

means responsive to an origination signal of a call received over a first one of said communication lines for generating a connect control signal,

means for determining if said origination signal is associated with a data transmission connection,

means responsive to a determined data transmission origination signal for generating an associated reconnect signal,

means for storing said reconnect signal in said call memory,

means responsive to a reorigination control signal of a subsequent data transmission call received over said first communication line for obtaining said reconnect signal from said memory, and

means controlled by said obtained reconnect signal for generating said connect control signal for establishing a new data transmission connection independent of any previously established data transmission connection.

4,291,201

PUSH-BUTTON DIAL ASSEMBLY FOR TELEPHONES

Walter R. Johnson, Simi Valley, and Gary M. Petaja, Sierra Madre, both of Calif., assignors to American Telecommunications Corporation, El Monte, Calif.

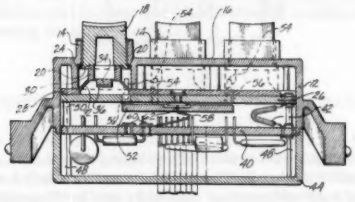
Filed Apr. 9, 1979, Ser. No. 28,166

Int. Cl.[3] **H04M** *1/50, 1/23*

U.S. Cl. 179—90 K **5 Claims**

1. A multiple push-button switch comprising a frame mem-

ber, a plurality of depressable push-buttons, means supporting each of the push-buttons on the frame member in a cluster, a common switch plate movably supported adjacent the back of the cluster of push-buttons, spring means mounted on the frame and engaging the switch plate for urging the switch plate toward the back of the push-buttons, means extending between each of the push-buttons and the switch plate for moving the switch plate against the urging of the spring means by depressing any one of the push-buttons, and switch means actuated by movement of the switch plate for breaking an electrical circuit when the switch plate is moved by any one of the push-buttons, the spring being a leaf spring mounted in cantilever fash-



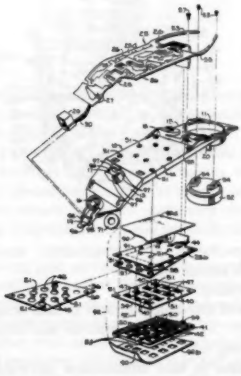
ion at one end to the frame member adjacent the switch plate, the other end of the leaf spring having a portion bearing against the switch plate, the end of the leaf spring bearing against the switch plate including a tip portion extending through an opening in the switch plate, the tip forming the moving contact of the switch means, the switch means including a fixed contact on the opposite side of the switch plate from the spring means, the tip portion normally contacting the fixed contact under the urging of the spring, movement of the switch plate by any of said push-buttons moving the plate and tip of the leaf spring away from the fixed contact to separate the contacts and break an electrical circuit.

4,291,202

TELEPHONE HANDSET CHASSIS AND FLEXIBLE PRINTED CIRCUIT

William J. Adams, Franklin; William F. Wernet, Nashville, and Steve W. Haskins, Laverne, all of Tenn., assignors to Northern Telecom, Inc., Ottawa, Canada

Filed Sep. 25, 1979, Ser. No. 78,693
Int. Cl.³ H04M *1/03, 1/23*
U.S. Cl. 179—103 **18 Claims**



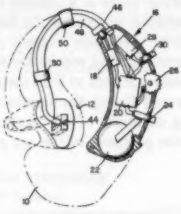
1. Apparatus for use in a telephone handset, comprising:
a rigid chassis of elongate form and including a transmitter mounting position at a first end, a receiver mounting position at a second end and a pushbutton dial position intermediate said ends, and a transverse slot through said chassis positioned between said dial position and said transmitter mounting position;
a flexible printed circuit member including a first portion extending from said receiver mounting position along a back surface of said chassis to said slot, said printed circuit member extending through said slot and including a second portion extending back over a front surface of said chassis, said second portion extending over said front surface having a pushbutton switch circuit thereon;
a pushbutton dial assembly mounted on said front surface of said chassis over said pushbutton switch circuit of said circuit member, at said dial position;
a receiver mounted on said circuit member and attached to said chassis at said receiver mounting position; and
a transmitter mounted at said transmitter mounting position.

4,291,203

HEARING AID DEVICE

Gaspare Bellafiore, 58 Stevens Rd., Cranston, R.I. 02910

Filed Sep. 11, 1979, Ser. No. 74,425
Int. Cl.³ H04R *25/00*
U.S. Cl. 179—107 E **2 Claims**

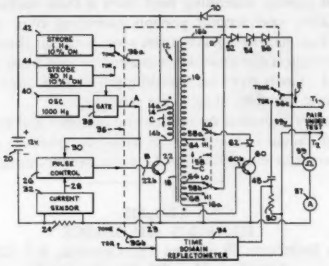


2. A hearing aid device, comprising an ear plug for insertion into the auditory canal of the user's ear, a microphone having a body portion and sound inlet portion that projects outwardly of said body portion, the body portion of said mircophone being completely embedded in said ear plug so as to be located in said auditory canal and said sound inlet portion projecting outwardly of said ear plug for being directly exposed to transmitted sound waves, a housing for location in close proximity to the ear of the user and having an amplifier located therein, said amplifier and microphone being electrically interconnected for the electrical transmission of sound waves received by said microphone to said amplifier, a transducer located in said housing and being electrically connected to said amplifier, and a sound tube, one end of which extends through said plug for communication with said auditory canal and the other end of which projects into said housing for communication with said transducer, wherein the amplified sound received from said microphone is transmitted by said transducer and sound tube to the auditory canal of the user, the interior of said sound tube being free and unobstructed to provide for fidelity of sound as transferred through said sound tube to the auditory canal of the user, said ear plug having a recess formed therein, said microphone being received in said recess and being located in the auditory canal such that the longitudinal axis of the microphone is parallel to the longitudinal axis of said ear plug, the sound inlet portion of said microphone extending outwardly beyond the adjacent surface thereof for insuring the exposure of said microphone to sound waves, a second microphone located in said housing and having a sound inlet portion that is exposed exteriorly of said housing, wherein said second microphone complements the first-named microphone for picking up all available sound waves for amplification and transmission to the auditory canal of the user.

4,291,204
FAULT LOCATING SYSTEM FOR ELECTRIC CABLES AND THE LIKE

Robert G. Crick, 850 Mesa Ave., Palo Alto, Calif. 94306

Continuation-in-part of Ser. No. 876,503, Feb. 9, 1978, abandoned. This application Aug. 13, 1979, Ser. No. 66,077
Int. Cl.³ G01R 31/08; H04B 3/46
U.S. Cl. 179—175.3 F 28 Claims

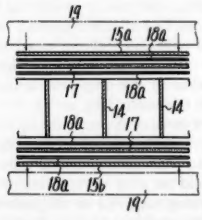


1. A system for locating a high resistance fault between a conductor pair comprising a switchable current pulse source for producing a current pulse at a voltage sufficient to temporarily arc across the fault to form at the fault a temporary arc plasma having a low resistance current path therethrough, nondissipating current limiting means for limiting the current through the low resistance path to limit the power dissipated in the arc so as to avoid fusing the conductor, and detecting means for affording detection of the location of the low resistance path during the presence of the arc plasma.

4,291,205
LAMINATED LOUDSPEAKER DIAPHRAGM WITH HONEYCOMB CORE AND DAMPING LAYERS

Yoshiyuki Kamon, Yokohama, and Jun Kishikami, Urawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 13, 1979, Ser. No. 75,492
Claims priority, application Japan, Sep. 19, 1978, 53-114892
Int. Cl.³ H04R 7/10
U.S. Cl. 179—181 R 10 Claims

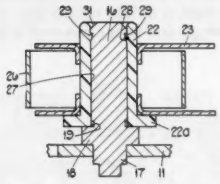


1. A diaphragm for an electro acoustic transducer, comprising:
- first and second sheet members;
- a honeycomb core member sandwiched between said first and second sheet members; and
- a damping layer interposed between each said sheet member and said core member for increasing the internal energy loss of the diaphragm.

4,291,206
CONTACT BREAKER ASSEMBLY

Richard D. Edmonds, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 30, 1979, Ser. No. 34,542
Claims priority, application United Kingdom, May 9, 1978, 18389/78
Int. Cl.³ H01H 19/00
U.S. Cl. 200—19 R 4 Claims

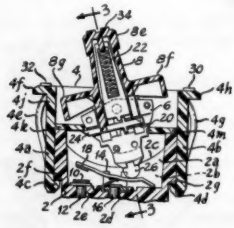


1. A contact breaker assembly including a pivot post, a fixed electrical contact, a heel assembly pivotally mounted on said post and a movable contact carried by said heel assembly and movable into and out of engagement with said fixed contact by pivotal movement of the heel assembly about said post, said heel assembly including a member having extending therein a bore within which a part of said post is received to pivotally mount the heel assembly on said post, said part of said post being formed with a circumferentially extending recess, and a radially inwardly extending projection on the wall of said bore which is resiliently engaged in said recess, said projection and recess co-operating to limit axial movement of the heel assembly relative to the post at least in one axial direction.

4,291,207
REMOVABLE PUSH-TO-UNLOCK ACTUATOR FOR LOCKING PIVOTED-SUBACTUATOR SELF-ENCLOSED ELECTRIC SWITCH

William L. Reinke, Cedarburg, Wis., and John W. Stearley, Smithfield, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 11, 1980, Ser. No. 111,149
Int. Cl.³ H01H 27/00
U.S. Cl. 200—42 R 4 Claims



4. A self-enclosed, pivoted-actuator, maintained-contact electric switch comprising:
- a switch housing;
- stationary and movable contacts in said housing;
- a subactuator pivotally mounted on said housing for closing and opening said contacts;
- locking means in said subactuator normally operative to catch on said housing to lock said subactuator in "off" position;
- a push-to-unlock actuator fitting over said subactuator;
- means for snap-in mounting said push-to-unlock actuator on said subactuator;

a spring trapped in said subactuator for biasing said push-to-unlock actuator into its ineffective position and being effective when pushed in to act on said locking means to retract the same and unlock said subactuator whereafter pivotal actuation of said push-to-unlock actuator carries said subactuator therewith to close said switch contacts;

said push-to-unlock actuator being removable by pulling it from said subactuator to prevent unauthorized closure of said switch contacts;

and said subactuator comprising an upstanding portion that retains said bias spring when said push-to-unlock actuator is removed and serves as a handle for actuating said subactuator from contacts-closed to contacts-open position wherein said locking means automatically catches on said housing to lock the switch.

4,291,208

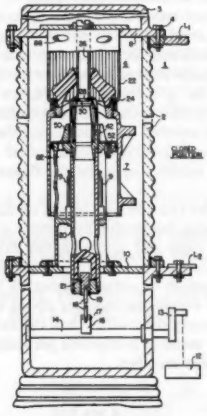
GAS-INSULATED CIRCUIT-INTERRUPTER HAVING IMPROVED INSULATING NOZZLE

Charles F. Cromer, Penn Township, Allegheny County; Kue H. Yoon, Pittsburgh; Robert L. Hess, North Versailles, all of Pa.; Thomas Kelsey, Northumberland, England, and Michael G. Caithness, Edinburgh, Scotland, assignors to Westinghouse Electric Corp., Pittsburgh, Pa. and Northern Engineering Industries Ltd., Newcastle upon Tyne, England

Filed Nov. 24, 1978, Ser. No. 963,633

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **9 Claims**



1. A gas-insulated circuit interrupter comprising:

a stationary contact assembly including stationary main contact means and stationary arcing contact means;

a movable contact assembly including movable main contact means and movable arcing contact means, said movable main contact means being cooperable with said stationary main contact means and said stationary arcing contact means being cooperable with said movable arcing contact means;

means for moving said movable contact assembly;

means for establishing a first flow of insulating gas in said circuit interrupter during an opening operation;

a hollow insulating nozzle having an interior surface and an exterior surface, said nozzle interior surface directing said first flow of insulating gas to blast into the arc established between said stationary and movable arcing contact means, said nozzle exterior surface being contoured to deflect said first flow of insulating gas away from said movable main contact means; and

means establishing a second flow of insulating gas past said movable main contact means.

4,291,209

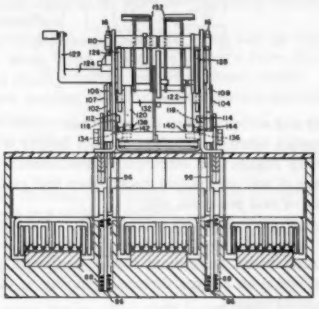
CIRCUIT BREAKER HAVING IMPROVED MOVABLE CONTACT-DRIVE MECHANISM INTERCONNECTION

Eugene H. Seidling, Monroeville, and Nicholas A. Salemi, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 967,670, Dec. 8, 1978, abandoned, which is a continuation of Ser. No. 808,572, Jun. 21, 1977, abandoned. This application May 9, 1980, Ser. No. 148,436

Int. Cl.³ H01H *1/22*

U.S. Cl. 200—153 G **4 Claims**



1. A circuit breaker comprising:

stationary contact means;

a plurality of movable contacts operable between open and closed positions with respect to said stationary contact means, said movable contacts being pivotally movable about a first axis;

a contact carrier engaging said movable contacts for holding said movable contacts such that said movable contacts move together between said open and closed positions;

a molded plastic insulating holder secured to said contact carrier and having an aperture therethrough;

a cross arm disposed within said holder aperture and extending outwardly, along a second axis different from said first axis, from opposite sides of said holder, said cross arm being electrically isolated from said movable contacts, said holder, said contact carrier, and said movable contacts moving upon movement of said cross arm; and

means directly engaging said cross arm on opposite sides of said holder for effecting movement of said cross arm to move said movable contacts between said open and closed positions.

4,291,210

SLIDE SWITCH

Robert Wolber, Lauterbach, and Walter Obergfell, Schramberg, both of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,591

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1978, 7827035[U]

Int. Cl.³ H01H *1/36, 15/00*

U.S. Cl. 200—252 **6 Claims**

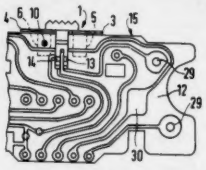
1. A slide switch in combination with a circuit board of the type which is generally planar having opposed surfaces and a peripheral edge extending between said surfaces, one of said surfaces including electrical conductor tracks, said switch comprising:

a guide bar disposed in facing relationship with said edge

and carrying a hand-manipulable grip projecting away from said edge to enable said guide bar to be slid relative to said edge between a plurality of positions, and

guide means extending from opposite sides of said guide bar in stradling relationship with said circuit board, and in resilient gripping engagement therewith to frictionally mount said switch on said circuit board, said guide means including:

a contact element extending from one side of said guide



bar and across said one surface of said circuit board, said contact element including contact fingers which resiliently engage and electrically interconnect respective ones of said conductive tracks when said guide bar is in one of said positions, and

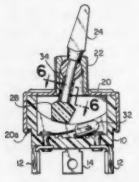
a pair of guide elements extending from the opposite side of said guide bar and across the other surface of said circuit board in resilient engagement with said other surface with a force directed opposite to that of said contact fingers.

4,291,211

ILLUMINATED TOGGLE SWITCH

Frank J. Discenza, Rocky Hill, Conn., assignor to Carling-switch, Inc., West Hartford, Conn.

Filed Dec. 3, 1979, Ser. No. 99,612
Int. Cl.³ H01H *9/16*
U.S. Cl. 200—311 **5 Claims**



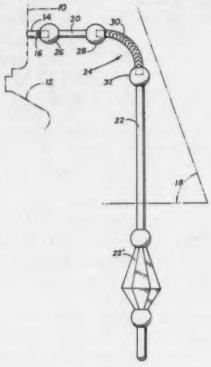
1. An electric switch comprising a case, a cover for the case defining an opening, a transparent plastic operating member with a portion projecting outwardly through said cover opening, annular collar means received on said member and defining a shoulder which bears against the inside of the cover opening to allow pivotal motion of the operating member in at least one plane, fixed and movable switch contact elements provided in the case, at least one light source located in fixed position inside the case remote from said collar shoulder, actuator means mounted on the inner end of said transparent operating lever and including means for engaging said movable contact element in response to pivotal operating lever movement, said actuator means defining light transparent window means movable over said light source when said operating member is in one position for transmitting light to the projecting portion of the operating member in said one position.

4,291,212

LAMP SOCKET SWITCH OPERATOR EXTENSION

Tren V. Bui, 5243 SW. Idaho St., Portland, Oreg. 97221

Filed Dec. 3, 1979, Ser. No. 99,758
Int. Cl.³ H01H *19/00, 3/10*
U.S. Cl. 200—331 **9 Claims**



1. For use with an electric lamp socket switch having a rotary operator shaft extending laterally from the socket, a switch operator extension comprising:

(a) a connector member arranged for connection at one end to the rotary shaft of an electric lamp socket switch for rotation with and about the same axis as said rotary shaft,

(b) an elongated extension member having one end portion arranged for gripping by the fingers for rotation of the extension member about its longitudinal axis, and

(c) a coupler member interconnecting the end of the connector member opposite the rotary shaft and the end of the extension member opposite the finger gripping end portion,

(d) the coupler comprising a length of snake chain characterized by being longitudinally flexible and rotationally substantially rigid and allowing the extension member to hang freely downward by gravity from the connector member and to be rotated about its longitudinal axis to rotate the connector member about its longitudinal axis simultaneously therewith when the axis of rotation of the connector member is disposed perpendicular to the axis of the extension member.

4,291,213

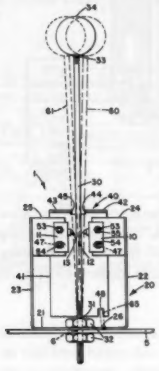
LEVER OPERATOR SWITCH ACTUATOR

Richard A. Felland, Waterloo, and James A. Miller, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 22, 1980, Ser. No. 189,479
Int. Cl.³ H01H *21/24*
U.S. Cl. 200—335 **2 Claims**

1. Control mechanism for mounting on a horizontal support, comprising: U-shape bracket means having a flat base abutting the support and fore-and-aft spaced apart front and rear legs integral with the base and rising therefrom to co-terminous upper ends, said ends respectively having flanges disposed in a common, fore-and-aft upright plane and directed toward each other and spaced apart fore and aft; means affixing the base of the bracket means to the support; a member in the form of an inverted L having a first part depending flatwise alongside the flanges and a second part extending laterally over the flanges and overlying and spaced above the base of the bracket means, said second part having a rectangular notch therein including front and rear laterally directed stop edges spaced apart fore and aft less than the fore-and-aft spacing of the bracket means legs; an elongated, upright control lever having a lower end affixed to the support and extending upwardly through the

notch in substantially centered relation to the stop edges, said lever being of resilient material so as to be selectively deflectible fore and aft in a range limited by the stop edges, said lever being recoverable to resume its substantially centered position; and front and rear actuators disposed respectively adjacent to the front and rear flanges of the bracket means to be selectively engaged by fore-and-aft movement of the lever; and front and rear means respectively securing the actuators to the flanges



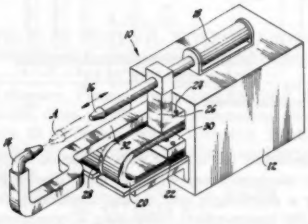
and to the first part of the L-shaped member, said front and rear securing means being selectively releasable and re-securable, and the legs of the bracket means being deflectible fore and aft upon release of the said rear securing means so as to enable selective fore-and-aft changes in the position of the notch, re-securing of said front and rear means serving then to retain the deflected positions of the legs and the changed position of the notch.

4,291,214

WELDING APPARATUS HAVING CLOSELY MOUNTED SHUNTS

John W. Arthurs, Bloomfield Hills, and Ronald Perkowski, South Lyons, both of Mich., assignors to Bra-Con Industries, Inc., Livonia, Mich.

Filed Dec. 19, 1978, Ser. No. 970,913
Int. Cl.³ B23K *11/10*
U.S. Cl. 219—86.1 **5 Claims**



1. In a spot welding machine, the combination comprising:
a transformer;
a first electrode;
a second electrode, movable with respect to the first electrode;
means for moving the second electrode toward the first electrode in a welding motion;
a first flexible shunt comprising a plurality of thin, elongated flexible metal strips having their ends joined together to collectively form a first leg, a second leg, and a bight connecting the first leg and the second leg, one end of said shunt being connected to the first electrode and its opposite end being connected to the transformer to form an electrical connection therebetween;
a second flexible shunt comprising a plurality of thin, elongated flexible metal strips having their ends joined together to collectively form a first leg, a second leg, and a bight connecting the first leg and the second leg, one end of the second shunt being connected to the transformer and its opposite end being connected to the second electrode to form an electrical connection therebetween;
the second shunt being mounted such that the first leg thereof is disposed parallel to the first leg of the first shunt, the second leg of the second shunt is disposed parallel to the second leg of the first shunt, the distance between the respective first legs of said shunts being substantially the same as the distance between the respective second legs of said shunts; and
said metal strips having a common width and the legs of the second shunt being disposed a distance from the legs of the first shunt a fraction of said common width.

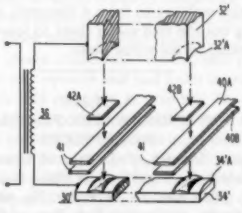
5. In a spot welding machine, a combination comprising:
a transformer;
a first electrode;
a second electrode movable with respect to the first electrode;
means for moving the second electrode toward the first electrode in a welding motion;
a first shunt having a planar surface and forming an electrically-conductive connection between the transformer and the first electrode;
a second shunt comprising a plurality of thin, elongated metal strips having their ends joined together to collectively form a first leg, a second leg, and a bight connecting the first leg and the second leg, one end of the second shunt being connected to the transformer and its opposite end being connected to the second electrode to accommodate the second electrode in said welding motion, said first and second legs having a common side edge disposed adjacent the planar surface of the first shunt such that the planar surface of the first shunt is parallel to the full length of the second shunt along said common side edge; and
the common side edge of the second shunt being disposed a distance from the planar surface of the first shunt of about ten percent of the width of said metal strips.

4,291,215

BONDING A HIGHLY CONDUCTIVE ARC-RESISTANT ELECTRICAL CONTACT PAD ON A METAL BODY

Moreland P. Bennett, and Edward A. Vrabel, both of Hickory, N.C., assignors to General Electric Company, Philadelphia, Pa.

Filed Mar. 29, 1979, Ser. No. 25,158
Int. Cl.³ B23K *11/20*
U.S. Cl. 219—118 **8 Claims**



1. A method of joining a highly conductive arc-resistant electrical contact pad of thin sheet form to a predetermined portion of a surface of a metal body, comprising the steps of:
(a) providing a contact pad of silver and of thin sheet form having a thickness of 0.0005 to 0.010 inches,

(b) providing a metal body to which said contact pad is to be joined,

(c) providing between said contact pad and said predetermined surface portion of said body an intermediate layer having opposed surfaces that respectively contact said pad and said surface portion, each of said opposed surfaces being of a metal that: (i) has a melting point of about 450° F. and lower than that of the metal of the surface it contacts and (ii) is compatible with the metal of the surface it contacts;

(d) placing the combination of said contact pad, said intermediate layer, and said metal body between a pair of opposed electrodes that contact said pad and said body and applying pressure through said electrodes that forces said contact pad toward said metal body with said intermediate layer located between said pad and said body,

(e) passing current between said electrodes while said pressure is being applied, thereby heating said pad, said layer, and said body,

(f) discontinuing said current for a brief cooling interval and then repeatedly passing current between said electrodes until the metal of said opposed surfaces of said intermediate layer has been sufficiently heated to melt,

(g) discontinuing said heating and allowing the molten metal of said intermediate layer to solidify, thereby providing a metallurgical bond between said pad and said body.

4,291,216

PROCESS FOR WELDING OF NOBLE METAL FOIL

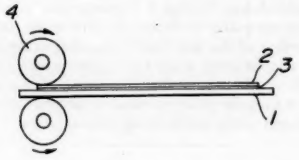
Kiyosumi Takayasu, No. 5-1, Horida-Dori, Mizuhomku Nagoya City, Japan

Filed Apr. 12, 1979, Ser. No. 29,436

Claims priority, application Japan, Apr. 22, 1978, 53/48058

Int. Cl.³ B23K *11/16*

U.S. Cl. 219—118 **6 Claims**



1. A process for welding a noble metal foil having a thickness of not more than 10μ to a metal plate having a high corrosion resistance and a high electrical conduction, there additionally being a thin metal sheet having a high electrical resistance, the process comprising:

piling on one another: the thin metal sheet, the noble metal foil and the metal plate with the noble metal foil being arranged between the plate and sheet;

welding the sheet, the foil and the plate together by electric resistance welding to form a laminate; and

dissolving out the thin metal sheet to leave the noble metal foil welded to the metal plate.

4,291,217

PROCESS FOR UNDERWATER PLASMA CUTTING OF WORKPIECES

Werner Braun, Munich, Fed. Rep. of Germany, assignor to Messer Griesheim, Frankfurt am Main, Fed. Rep. of Germany

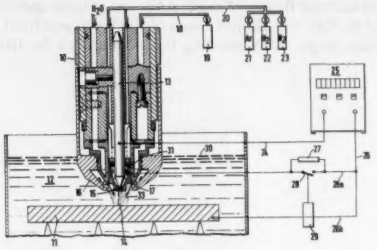
Filed Aug. 14, 1979, Ser. No. 66,638

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 2842693

Int. Cl.³ B23K *9/00, 9/16*

U.S. Cl. 219—121 PH **1 Claim**

1. In a process for the underwater plasma cutting of workpieces such as structural steel, the improvement being carrying out the cutting process with a plasma burner having a needle electrode and transmitted plasma arc at small distances under the water level, and enveloping the plasma cutting arc during the ignition cutting by a compressed-air sheath solely outside of the nozzle which strongly contracts the plasma cutting arc, flowing the compressed-air sheath at a velocity in the range of



3,000 to 15,000 m/minute, utilizing a current density in the range of 50 to 80 A/mm², and directing the compressed-air sheath to the area of the cut by flowing the compressed air from slots in the nozzle located close to the discharge opening of the nozzle.

4,291,218

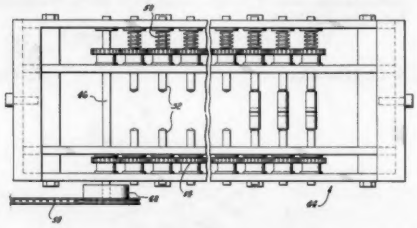
TRANSDUCER DIAPHRAGM ELEMENTS AND METHODS AND APPARATUS FOR MAKING SAME

Kjell E. Myhre, 941 Enterprise Ave., Inglewood, Calif. 90302

Continuation of Ser. No. 752,108, Dec. 20, 1976, abandoned. This application Sep. 4, 1979, Ser. No. 71,807

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—121 EC **11 Claims**



1. In apparatus for making edge mounted diaphragm elements by electron beam welding, each diaphragm element including a diaphragm and a heat-conducting first tubular member, the improvement comprising in combination:

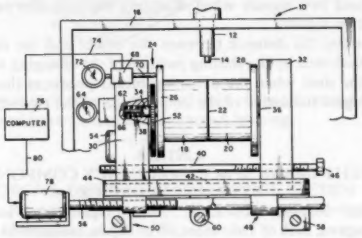
a fixture including a first shaft for retaining a first tubular member in heat-transfer relationship with a first peripheral region on one major surface of a diaphragm and a second shaft axially aligned with and spaced from said first shaft for retaining a heat-conducting second tubular member in heat-transfer relationship with a second peripheral region on the opposite major surface of said diaphragm; and

means for rotating via said first and second shafts said diaphragm and, respectively, said retained first and second tubular members in mutual heat-transfer relationship relative to an electron beam, including means coupled to both of said first and second shafts for simultaneously driving both of said shafts.

4,291,219
APPARATUS FOR MAINTAINING ALIGNMENT OF A SHRINKING WELD JOINT IN AN ELECTRON-BEAM WELDING OPERATION

Jett B. Trent, Knoxville, and Jimmy L. Murphy, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 3, 1980, Ser. No. 109,364
Int. Cl.³ B23K *15/00*; G05D *3/12*; B23K *37/04*
U.S. Cl. 219—121 EY **5 Claims**



1. Apparatus for maintaining accurate alignment of a weld joint with respect to an electron beam due to shrinkage in the weld joint area during a multipass, electron-beam welding operation comprising, fixture means for supporting the fay surfaces of workpieces to be joined together by electron-beam welding in an abutting relationship, said fixture means including a first portion thereof disposed contiguous to one of said workpieces, a second portion of said fixture means spaced from said workpiece by said first portion and supporting said first portion in a relatively movable manner with respect thereto, bias means intermediate to and bearing against said first portion and said second portion for urging said first portion away from said second portion and towards said workpieces, sensing means for measuring the displacement of said first portion away from said second portion in a direction towards said workpiece upon said shrinkage in the weld joint area, and moving means coupled to said fixture means for displacing the latter in response to a signal from said sensing means indicative of said displacement of said first portion for effecting the said alignment of the weld joint.

4,291,220
METHOD OF WELDING UTILIZING BOTH CONSUMABLE AND NON-CONSUMABLE ELECTRODES

Gerald G. Lessmann, Pleasant Hills, Pa.; Ronald P. Simpson, Old Saybrook, Conn.; William J. Reichenecker, Penn Hills, and Ronald D. O'Brokta, Kiski Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1979, Ser. No. 102,598
Int. Cl.³ B23K *9/16*
U.S. Cl. 219—137 R **2 Claims**

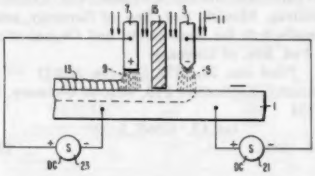
1. A method of welding a highly conductive workpiece comprising the steps of:

connecting a power source of straight polarity to a non-consumable electrode and a power source of reverse polarity to a consumable electrode;

producing a first arc between said non-consumable electrode and said highly conductive workpiece, and moving said first arc relative to said highly conductive workpiece at a generally uniform rate;

producing a second arc between said consumable electrode and said highly conductive workpiece;

positioning said second arc adjacent said first arc and moving said second arc relative to said highly conductive workpiece generally at said generally uniform rate; and

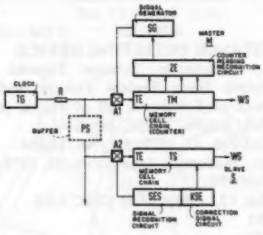


blanketing said highly conductive workpiece in the vicinity of said arcs with inert gas to weld said highly conductive workpiece.

4,291,221
DIGITAL SEMICONDUCTOR CIRCUIT

Otto Muehlbauer, Munich; Klaus D. Bigall, Vaterstetten, and Helmut Roessler, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 14, 1979, Ser. No. 48,605
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1978, 2828822; Mar. 20, 1979, 2910919
Int. Cl.³ G06M *3/12*
U.S. Cl. 235—92 CC **16 Claims**



1. A digital semiconductor apparatus, comprising:

a clock for generating standard clock pulses;

first and second pulse counters each comprising a plurality of memory cells, an input terminal connected to receive clock pulses and a plurality of outputs, each counter operable to count clock pulses applied thereto;

signal generator means connected between said plurality of outputs of said first counter and said input terminal of said second counter and operable in response to a predetermined count to produce a digital pulse to modulate a pulse onto the clock pulse appearing at the input terminal of said second counter to provide a modulated clock pulse;

a modulated clock pulse recognition circuit connected to said input terminal of said second counter and operable to produce a recognition signal in response to the occurrence of a modulated clock pulse; and

a correction signal circuit connected between said modulated clock pulse recognition circuit and each of said memory cells of said second counter, and responsive to a recognition signal to set said second counter to a predetermined count.

4,291,222
METHOD AND APPARATUS FOR CARD AUTHENTICATION USING DISPLAY OF SYMBOLS FOR IDENTIFICATION OF A PERSONAL CODE WORD

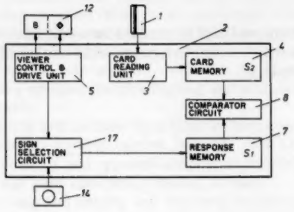
Helmut Gröttrup, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 52,033

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758754

Int. Cl.³ G06K *5/00*

U.S. Cl. 235—380 **21 Claims**



9. In apparatus for verifying use by an authorized person of a card having readable code information thereon, symbol presentation means for presenting symbols to a user, said symbols including a set of symbols which form a personal code word supplied to an authorized user and which corresponds to said code information and additional symbols which do not form said personal code word, response means for operation by a user to develop response signals measuring his response to symbols presented by said presentation means, and comparator means for comparing said response signals with code information obtained from a card presented by the user.

4,291,223
DISTANCE DETECTING DEVICE

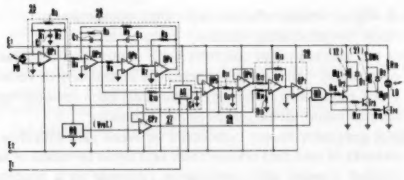
Toshio Sakane, Yokohama; Tetsuya Taguchi, Kawaski; Masahiko Ogawa, Hino; Shuichi Tamura, and Tokuichi Tsunekawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,294

Claims priority, application Japan, Feb. 24, 1978, 53-20659; Jul. 25, 1978, 53-90585

Int. Cl.³ G03B *3/10*; G01C *3/08*

U.S. Cl. 250—201 **30 Claims**



1. A distance detecting device for detecting a distance between an object and the device, comprising:

(A) means for projecting a radiation to the object;

(B) means for sensing the radiation reflected by and coming from the object, said sensing means producing an output signal indicative of the intensity of the received radiation;

(C) means for relatively changing an incident position of the projected radiation to said sensing means, said changing means being shiftable from a predetermined position to change said incident position of the projected radiation to the sensing means relatively, each shifting position of the changing means being indicative of the distance between the object and the device; and

(D) circuit means responsive to the output signal of said sensing means, said circuit means including:

(D-1) delay means receiving the output signal of the sensing means and providing a delayed signal having a predetermined delay relative to the output signal of the sensing means, and

(D-2) means for detecting the coincidence between the output signal of the sensing means and the delayed signal provided by said delay means, said detecting means producing an output signal indicative of the coincidence of said two signals when detecting the coincidence of the two signals;

thereby the distance between the object and the device is indicated by the shifting position of the changing means at the time when the detecting means produces the output signal indicative of the coincidence of the two signals.

4,291,224
LIGHT IMAGE SPACE FREQUENCY COMPONENT EXTRACTING DEVICE

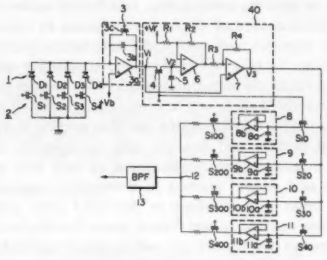
Hiroshi Shirasu, Kawasaki; Akira Ogasawara, and Ken Utagawa, both of Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,153

Claims priority, application Japan, Nov. 30, 1978, 53-163826[U]

Int. Cl.³ G01U *1/20*

U.S. Cl. 250—204 **4 Claims**



1. A device for extracting the space frequency component of an image formed by an optical system, comprising:

(a) means having a photoelectric element array including a plurality of photoelectric elements on which said image is projected and time-sequentially generating, at a predetermined period, a pulse output having a magnitude corresponding to the intensity of light received by each of said photoelectric elements;

(b) means for successively storing the respective pulse outputs;

(c) means for converting each of the stored pulse outputs into an AC signal; and

(d) means for adding together said AC signals and generating the same.

4,291,225
MOLDED PLASTIC PHOTO-OPTICAL KEYBOARD

Edward I. Nelson, Sunrise, Fla., assignor to Burroughs Corporation, Detroit, Mich.

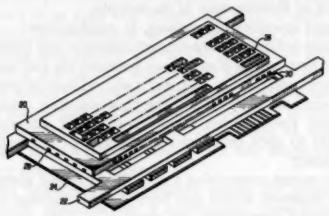
Filed Sep. 14, 1979, Ser. No. 75,366

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—229 **18 Claims**

1. A photo-optical keyboard comprising: a keyboard housing having a matrix of rows and column of apertures for key mounting, the underside surface of said housing having a light

channel for each row passing between the apertures in each row and a light channel for each column passing between the



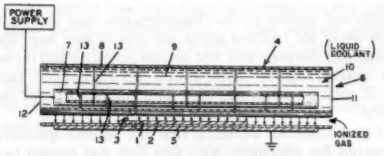
apertures ineach column, each said light channel opening up to the underside surface of said keyboard housing.

4,291,226

CORONA DISCHARGE ELECTRODE SYSTEM

Werner Rueggeberg, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 10, 1980, Ser. No. 128,540
Int. Cl.[3] H01T *19/04;* G01M *21/01*
U.S. Cl. 250—324 **9 Claims**



1. A liquid cooled, liquid-quartz buffered corona discharge electrode system capable of sustaining a power density of up to 200 watts per square inch comprising:

(a) a cylindrical electrode;

(b) a quartz tube of larger diameter than the electrode, encasing the electrode and providing a cylindrical passageway between the surface of the electrode and the inside wall of the quartz tube, the quartz tube having at one end a liquid inlet means and at the other end a liquid outlet means for the passage of a liquid buffer dielectric/coolant whereby the liquid buffer dielectric/coolant is supplied through the inlet means, passes through the cylindrical passageway in contact with the surface of the electrode and exits through the outlet means;

(c) a plurality of spacer means interposed between the electrode and the inside wall of the quartz tube serving to hold the electrode stationary in the quartz tube whereby the electrode is prevented from deflecting due to the electrical forces generated during corona formation; and,

(d) a ground electrode means positioned parallel to and spaced a distance apart from the quartz tube forming therebetween a corona discharge region including a gas wherein a material to be treated is passed.

4,291,227

RAPID SCANNING SYSTEM FOR FUEL DRAWERS

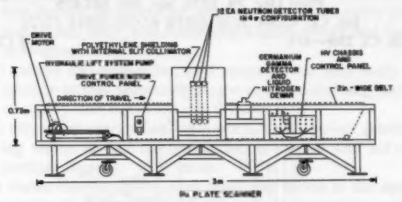
John T. Caldwell; Paul F. Fehlau, and Stephen W. France, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 2, 1979, Ser. No. 90,845
Int. Cl.[3] G01T *1/00;* H01J *47/12*
U.S. Cl. 250—328 **12 Claims**

1. In a system for rapidly investigating nuclear fuel drawers, the method comprising:

(a) quantitative sensing of neutrons produced by nuclear decomposition;

(b) simultaneous, energy resolved monitoring of emitted gamma rays;



(c) automatic reading of fuel drawer identifying information; and

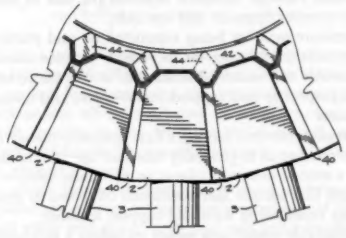
(d) analyzing in real time the information obtained for said fuel drawers by steps (a) through (c) utilizing a microprocessor.

4,291,228

DETECTOR SHAPE AND ARRANGEMENT FOR POSITRON ANNIHILATION IMAGING DEVICE

Christopher J. Thompson, Montreal, Canada, assignor to Montreal Neurological Institute, Montreal, Canada

Filed Aug. 28, 1979, Ser. No. 70,372
Claims priority, application Canada, Jun. 19, 1979, 330087
Int. Cl.[3] G01T *1/20*
U.S. Cl. 250—363 S **10 Claims**



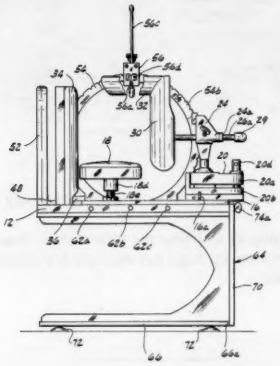
1. A scintillation detector for use in the detection of annihilation radiation in a positron disintegration process, said detector comprising an array of detector elements, each element being a crystal of bismuth germanate, each crystal having a first end face of a first area and a second, opposite and parallel end face of a second area larger than said first area, at least the side surfaces of each crystal having a light reflective coating thereon, said plurality of detector elements being disposed in a common plane, equally spaced apart about a common circle with each detector element having its said first end face directed to and spaced apart from the center of said circle for exposure to radiation from points within said circle and within said common plane and adjacent planes, allowing radiation from the points to pass into said first end face of each of said crystals, through each of said crystals, and out said second end face of each of said crystals; and a light amplifying device in optical contact with said second end face of each of said crystals.

4,291,229

SUPPORT AND RESTRAINING DEVICE FOR ARTHOGRAPHIC EXAMINATION OF THE KNEES

Kenneth W. Patt, 5131 Warren Rd., Imperial, Mo. 63052

Filed Dec. 10, 1979, Ser. No. 101,675
Int. Cl.[3] G21K *5/08;* G03B *41/16;* H01J *37/20*
U.S. Cl. 250—451 8 Claims



1. A support and restraining device for arthrographic examination of a knee, comprising:

a horizontal platform;

a clamp unit means mounted on said platform for supporting and restraining a patient's leg above said platform;

said clamp unit means including a vertically adjustable horizontal support member adapted to support the weight of such leg above said platform and an adjustable restraining means for securing such leg in a selective position on said support member and for permitting stress to be applied to such knee in order to open the knee joint; an upstanding member adjacent one side of said support member and a pressure member mounted adjacent the side of said support member opposite said one side;

said pressure member being supported on said platform by adjustable positioning means which provide selectively adjustable and secure placement of said pressure member with respect to said support member and said upstanding member

said pressure member having a first generally planar section positioned so as to generally face said upstanding member and a second generally planar section immovably secured to said first section and positioned over and in generally facing relationship with said support member;

said adjustable positioning means including a universal joint unit for selective tilting and secure location of said pressure member with respect to said platform and a linear adjustment means for selective movement of said pressure member towards and away from said upstanding member and said support member and for secure location with respect thereto.

4,291,230

FLUOROMETRIC ANALYZER INCLUDING SHUTTER MEANS FOR SIMULTANEOUSLY SHIELDING SAMPLE AND PHOTODETECTOR DURING SAMPLE CHANGE

Louis R. Heiss, Annapolis, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 7, 1979, Ser. No. 18,152
Int. Cl.[3] G01N *21/38;* G01J *1/58;* G01N *21/01*
U.S. Cl. 250—458 7 Claims

1. A head assembly for a fluorometric analyzer for measuring fluorescence in a liquid sample element contained within a test cell, wherein the analyzer includes,

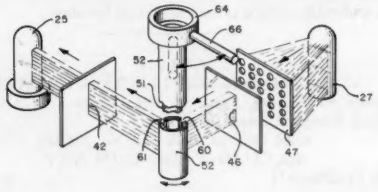
an excitation lamp element for applying radiation to the sample, and

a photodetector element for detecting light produced as a result of fluorescence in the sample;

said head assembly comprising, in combination:

a housing defining a bore-shaped chamber, and further defining a first optical passageway between the excitation lamp element and the test cell, and a second optical passageway between the test cell and the photodetector element, said optical passageways being arranged at generally right angles to each other and to the axis of the bore-shaped chamber;

shutter means comprising a cylindrical sleeve member slidably received within said bore-shaped chamber for simultaneously controlling the passage of light through said



first and second optical passageways, said sleeve being mounted for rotation about the axis of said bore-shaped chamber between first and second positions and including a central recess for slidably receiving the test cell, said test cell rotating about said axis with rotation of said sleeve; and

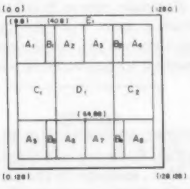
said sleeve further including first and second apertures arranged for alignment with said first and second optical passageways and said sample-receiving recess for establishing light communication between the excitation lamp element, the sample element, and the photodetector element when said sleeve is in said first position, and arranged for non-alignment with said first and second optical passageways for blocking light communication between said elements when said sleeve is in said second position.

4,291,231

ELECTRON BEAM EXPOSURE SYSTEM AND AN APPARATUS FOR CARRYING OUT THE SAME

Kenichi Kawashima, Yokohama; Hiroshi Yasuda, and Kenyu Uema, both of Tokyo, all of Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 21, 1978, Ser. No. 971,693
Claims priority, application Japan, Dec. 30, 1977, 52-158411
Int. Cl.[3] H01J *37/00*
U.S. Cl. 250—492 A 8 Claims



1. An electron beam exposure system for projecting an image on a material at a plurality of locations with respect to said material, said image being composed of a plurality of patterns of regions to be exposed, said patterns being arranged at predetermined locations with respect to said image and said regions being arranged at predetermined locations with respect

to the corresponding pattern, at least one of said patterns appearing more than once within said image so that not all of the patterns forming said image are unique, comprising

first memory means for storing pattern data for each unique pattern in at least one image, the pattern data for each pattern corresponding to the dimensions of each region forming said pattern and to the position of each region forming said pattern with respect to said pattern;

second memory means for storing image data for said at least one image, said image data corresponding to the position with respect to said at least one image at which each unique pattern forming said at least one image appears on every occurrence thereof;

electron beam exposure column means for projecting an electron beam having a rectangular cross-section, said electron beam exposure column means including positioning means for positioning said material for exposure to said electron beam, first deflection means for controlling the dimensions of said electron beam, and second deflection means for controlling the position of said electron beam;

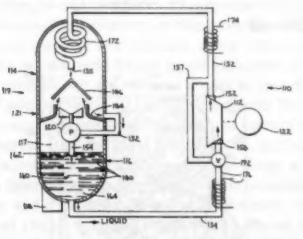
and control means operatively connected to said first and second memory means and to said electron beam exposure column means for projecting said at least one image, said control means comprising first means for moving said positioning means to allow material supported thereon to achieve said at least one image, second means for combining said pattern data and said image data to derive a position signal corresponding to the position of each region within said at least one image to be exposed, said position signal being communicated to said second deflection means, and third means for deriving from said pattern data a dimension signal corresponding to the rectangular dimensions of each region within said at least one image to be exposed, said dimension signal being communicated to said first deflection means.

4,291,232

LIQUID POWERED, CLOSED LOOP POWER GENERATING SYSTEM AND PROCESS FOR USING SAME

Joseph T. Cardone, 18348 Lahey St., Northridge, Calif. 91324, and Kenneth J. Shatz, 1865 N. Fuller, Hollywood, Calif. 90046

Filed Jul. 9, 1979, Ser. No. 55,991
Int. Cl.³ F01K *25/10*
U.S. Cl. 290—1 R **15 Claims**



1. A liquid powered, closed loop power generating system comprising:

(a) a power generating means for generating power substantially as a result of the flow of a pressurized solvent medium therethrough from an inlet to an outlet;

(b) means for physically dissolving a gas in said solvent medium to produce a solution, thereby lowering the pressure of said gas and maintaining said flow of said solvent medium; said dissolving means containing said solution therein, and having gas and solvent medium inlets located above said solution, the incoming gas and incoming solvent medium coming into direct contact at a zone within said dissolving means;

(c) means for separating said dissolved gas from said solvent medium in said solution and increasing the pressure of said gas, said separating means containing a body of said solution therein, including an upper portion and a lower portion of said body, and containing a space above said body of solution;

(d) means for connecting said space above said body of solution in said separating means to said dissolving means to supply said separated gas thereto;

(e) means for connecting said outlet of said power generating means to said dissolving means to pass said solvent medium thereto;

(f) means for connecting said dissolving means to the upper portion of the body of solution in said separating means, and means for impelling said solution to said upper portion of said body of solution; and

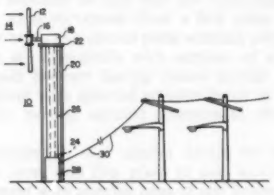
(g) means for supplying the separated solvent medium from the lower portion of the body of solution in the separating means to said inlet of said power generating means, whereby the separated solvent medium is recycled into the power generating system.

4,291,233

WIND TURBINE-GENERATOR

Herbert S. Kirschbaum, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1980, Ser. No. 116,372
Int. Cl.³ F03D *1/00*
U.S. Cl. 290—1 C **2 Claims**



1. A wind turbine generator system comprising:

(a) a turbine and affixed shaft rotatable by a wind;

(b) gearing for transposing the rotational energy of said turbine and affixed shaft into rotational energy of a first shaft rotating in one direction and a second concentric shaft rotating in the opposite direction;

(c) a generator rotor;

(d) a stator disposed concentrically about said rotor; and

(e) planetary gearing cooperatively relating said shafts and said rotor and stator such that said rotor rotates in one direction and said stator rotates about said rotor in the opposite direction, said stator being rigidly connected to the outer one of said concentric shafts so as to rotate at the same velocity as said outer shaft, said rotor being driven by said planetary gearing to rotate at a velocity different than the rotational velocity of the inner one of said concentric shafts.

4,291,234

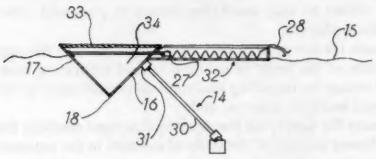
APPARATUS FOR GENERATING ELECTRICITY

Steven J. Clark, Apt. 12, 1544 Meadowlark Dr., Great Falls, Mont. 59404

Filed Dec. 17, 1979, Ser. No. 104,004
Int. Cl.³ F03B *13/12*
U.S. Cl. 290—53 **12 Claims**

1. Apparatus for generating electricity including a chamber, anchoring means for positioning said chamber in a body of water with wave movement, means for generating an electrical current disposed within said chamber, and means for transfer-

ring said electrical current from said chamber; said chamber including first and second sidewall sections spaced from each other over at least a portion of their surfaces, endwall sections connecting said sidewall sections, said sidewall sections and said endwall sections being connected to each other to form a substantially liquid tight chamber, said anchoring means including means for maintaining the first of said sidewall sections remote from said waves and fixed against movement from the action of said waves, said anchoring means including for anchoring the second of said sidewall sections in the path of said



waves while permitting said second sidewall section to be moved by the action of said waves, said generating means including electrically conductive coil means, magnet means associated with said coil means and movable with respect thereto, said coil means being affixed to one of said sidewall sections and said magnet means being affixed to the other of said sidewall sections, said transfer means being connected to said coil means, and biasing means urging said second sidewall section away from said first sidewall section against the action of said waves.

4,291,235

WINDMILL

Karl H. Bergey, Jr., and Michael L. S. Bergey, both of Rte. 1, Box 151-B, Norman, Okla. 73069

Filed Feb. 26, 1979, Ser. No. 15,290

Int. Cl.[3] **F03D** *9/00;* **H02P** *9/04;* **H02K** *7/00;* **B63H** *1/26*

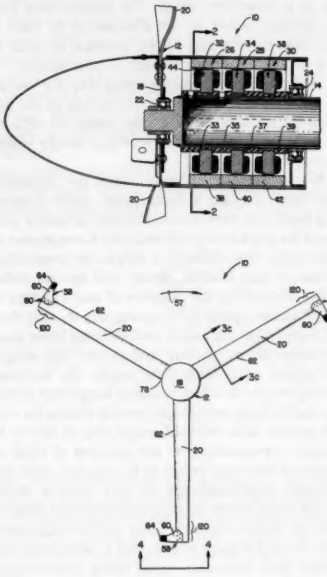
U.S. Cl. 290—55 **31 Claims**

13. A windmill, comprising:

a shaft;

a turbine blade system;

first and second permanent magnet alternators, each of said alternators including a multiple pole stator fixedly mounted on said shaft and a multiple magnet permanent magnet structure rotatably mounted coaxial with said stator, said turbine blade system being connected to said magnet structures to rotate therewith, the poles of said stator of said second alternator being angularly offset from the poles of said first alternator and wherein the magnets of said magnet structures of said first and second alternators are aligned in axial rows so that only one of said first and second alternators can have the poles of its stator



radially aligned with the magnets of its magnet structure at any given time.

4,291,236

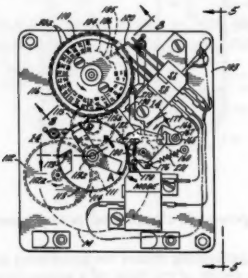
REMOTE RECEIVER FOR LOAD AND RATE CONTROL IN A POWER TRANSMISSION SYSTEM

Charles C. Patton, Springfield, Ill., assignor to Sangamo-Weston, Inc., Atlanta, Ga.

Filed Jun. 29, 1979, Ser. No. 53,295

Int. Cl.[3] **H02J** *3/14*

U.S. Cl. 307—40 **6 Claims**



1. In a power transmission system of the type in which pulsed coded messages are imposed on the power lines for signaling, the message having a plurality of defined pulse positions, an improved receiver connected to the power lines for decoding and responding to said messages comprising, a code cam having a defined start position, a plurality of manually

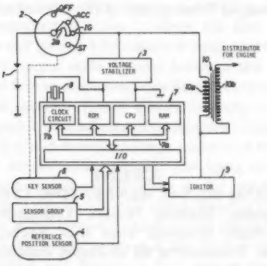
selectable preselect positions and a plurality of manually selectable operate positions; means for intiating rotation of the code cam upon receipt of a start pulse in said message and rotating said code cam in synchronism with said pulse positions, means associated with the code cam and manually selected preselect and operate positions thereon for detecting preselect and operate pulses assigned to said receiver, means for arming the receiver in response to detection of the assigned preselect pulse, output means having two conditions for performing a control function, means for switching the output means only in response to receipt of the assigned operate pulse, and means for disabling switching of said output means in response to the operate pulse until the receiver is armed by the preselect ..se.

4,291,237

ANTI-THEFT SYSTEM FOR AUTOMOTIVE VEHICLES

Takio Kitano, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 31, 1979, Ser. No. 44,212
Claims priority, application Japan, Jun. 2, 1978, 53-66996
Int. Cl.³ B60R *25/04*
U.S. Cl. 307—10 AT **4 Claims**



1. In combination with an electrical control apparatus adapted for controlling the prime mover of an automotive vehicle, said electrical control apparatus having control means for controlling the operation of said prime mover in accordance with changes of a condition of said prime mover, switch means for selectively connecting or disconnecting said apparatus to and from a source of electricity, a first electrical circuit for generating an electrical binary signal indicative of a condition of said prime mover at a selected instant in time during the operation of said prime mover, a digital computer for calculating a value corresponding to a setting of said control means by receiving therein said electrical binary signal, said computer being programmed to calculate said value from a function describing a desired relationship between the condition of said prime mover and the setting of said control means, and a second electrical circuit coupled between said digital computer and said control means for converting said value into the setting of said control means, an anti-theft system comprising:

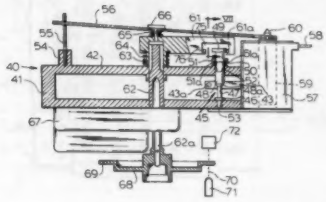
an electrical control circuit associated with said switch means for generating a control signal therefrom only when said switch means is operated in an authorized manner to connect said apparatus to said source of electricity, and said computer is arranged to be activated even when said apparatus is connected to said source of electricity in an unauthorized manner, and wherein said computer is further programmed to discriminate whether the control signal is produced or not and to halt calculation of said value upon discriminating lack of the control signal to make said second electrical circuit inoperative.

4,291,238

POWER SWITCH MODULE

Albert T. Braga, Lincoln Township, Berrien County; Roger J. Cartier, Benton Township, Berrien County; Edward H. Getz, Pipestone Township, Berrien County, and Warren R. Hafstrom, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 4, 1980, Ser. No. 118,599
Int. Cl.³ H01H *43/04, 43/10*
U.S. Cl. 307—141.4 **19 Claims**



1. A power switch module for use with a control device for sequential energization of a plurality of electrical components connected in circuit with said module, said module comprising:

a rotatable shaft;

means for rotating said shaft;

a plurality of switches each having an open and a closed state;

a plurality of switch actuators disposed around said shaft, said actuators being movable to change a switch state, each said actuator having a head thereon;

a hammer mounted on said shaft for rotational movement and for axial movement from a first plane above said actuator heads to a second plane wherein portions of said hammer are engageable with portions of said actuator heads said hammer having means carried thereon for engagement with selected actuator heads in said second plane for moving selected actuators to change switch states;

means operated by said control device for moving said hammer from said first plane to said second plane for engagement with selected ones of said heads; and

a feedback means associated with said shaft to relay a signal corresponding to the angular position of said shaft to said control device,

whereby said control device operates said hammer moving means upon receipt of a pre-determined angular position signal to engage said hammer with an actuator head to change a switch state.

4,291,239

ARCHITECTURE LINE-TRANSFER CCD IMAGERS

Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,103
Int. Cl.³ G11C *19/28;* H01L *29/78, 27/14, 31/00*
U.S. Cl. 307—221 D **24 Claims**

1. A charge-transfer imager of the line transfer type comprising;

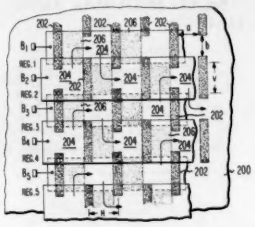
a substrate,

means for dividing said substrate into a predetermined two-dimensional array of spaced charge-storage islands that communicate with one another through charge-transfer regions, said array defining a substantially uniform spatial distribution pattern of said storage islands and transfer regions,

wherein said storage islands are arranged in n spaced rows numbered 1, 2 . . . (n−1), n, with each row comprised of a plurality of spaced islands and with each island of each row being coupled through respective individual transfer regions to each of first and second neighboring islands of an adjacent row on one side thereof and also to each of

first and second islands of an adjacent row on the other side thereof, and

means for applying predetermined control voltages to any selected row and to at least one of the rows adjacent thereto, said predetermined control voltages having certain values relative to each other as a given periodic function of time such that said selected row and the row or



rows adjacent thereto to which such predetermined control voltages are applied form a charge-transfer register for a separate line of picture elements in which said picture elements of that separate line are transferred in a given direction along that charge-transfer register from storage island to adjacent storage island thereof at a rate determined by said given periodic function of time.

4,291,240

TWO OUTPUT CLOCK FOR INTEGRATED SEMICONDUCTOR DIGITAL CIRCUITS

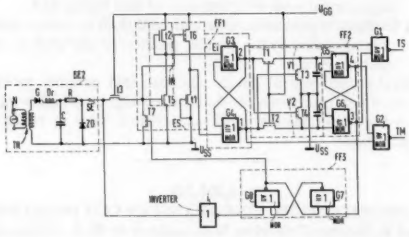
Helmut Rösler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,678

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837882

Int. Cl.³ H03K *5/00*

U.S. Cl. 307—262 **8 Claims**



1. A clock pulse converter for use with integrated semiconductor digital circuits, said converter having an input connected to a periodic signal supply and having two signal outputs at which different digital pulses having the same period appear, said converter comprised of:

an input level circuit having an input resistor connected to said signal supply and having controlled inverted and non-inverted signal outputs;

a first flip-flop cell having two inputs connected to respective ones of said input level circuit outputs and having first and second signal outputs;

two equivalent delay lines each having an input connected to a respective one of said first flip-flop cell outputs, and each having an output;

a second flip-flop cell having two signal inputs each connected to a respective one of said delay line outputs, said second flip-flop cell having a first signal output which in the absence of a delay between the signal inputs of the first flip-flop cell and the signal outputs of the second flip-flop cell would be synchronized with and have the same logical state as the inverted signal input to the first flip-flop cell, said second flip-flop cell also having a second output having the opposite logical state;

a third flip-flop cell having two signal inputs, one of which is connected to said first signal output of said second flip-flop cell and the other of which is connected through an inverter to said signal supply, said third flip-flop cell having two available outputs, only one of which is connected to said input level circuit for controlling the output thereof, said connected third flip-flop cell output changing to a controlling logical state in sequence after the other available output reaches said state;

a first output logic gate having two signal inputs, one of which is connected to said first output of said second flip-flop cell, and the other of which is connected to the output of said first flip-flop cell which, in the absence of the delay lines would be synchronized with and display the same logic level as the first output of said second flip-flop cell, said output logic gate having an output forming one converter output; and

a second logic output gate having two signal inputs, one of which is connected to the second signal output of the second flip-flop cell, and the other of which is connected to the output of said first flip-flop cell not connected to the first logic output gate, said second logic output gate having an output forming one of the converter outputs.

4,291,241

TIMING SIGNAL GENERATING CIRCUIT

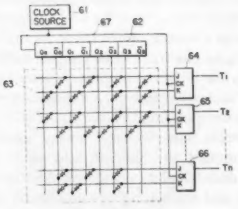
Koichi Mayama, Mobara; Noboru Yamaguchi, Kokubunji; Mamoru Sugie, Hachioji; Yuzo Kita, Fuchu, and Shigeru Yoshizawa, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1979, Ser. No. 12,708

Claims priority, application Japan, Feb. 20, 1978, 53-17662

Int. Cl.³ H03K *5/15*

U.S. Cl. 307—269 **10 Claims**

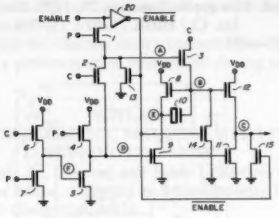


1. A timing signal generating circuit comprising clock source means for generating basic clock pulses of a predetermined period, binary counter means for counting the number of clock pulses from said clock source means and for providing the count value as a binary code output, means forming a logical array for decoding the output of said binary counter means and providing outputs, said logical array means including semiconductor elements arrayed in the form of a matrix, and flip-flop means for being set and reset in response to outputs of said logical array means at the timing of the clock pulses applied thereto from said clock source means and providing outputs for utilization as timing signals.

4,291,242
DRIVER CIRCUIT FOR USE IN AN OUTPUT BUFFER

Gene A. Schriber, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1979, Ser. No. 41,227
Int. Cl.[3] H03K 5/135, 17/10, 17/284, 19/096
U.S. Cl. 307—270 7 Claims

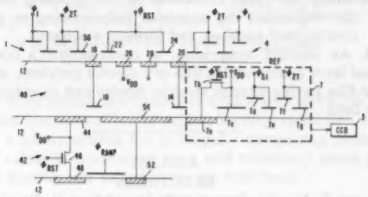


1. A high speed driver circuit having field effect transistors and a first and a second voltage node, comprising: a first pair of transistors connected in series between the first and second voltage nodes and having a first and a second control electrode and having an output node formed between the first pair of transistors, the first control electrode being coupled to a clocking signal, the second control electrode being coupled to a precharge signal; a second pair of transistors coupled in series between the first and second voltage nodes and having a first and a second control electrode and providing an output, the first control electrode being coupled to the precharge signal and the second control electrode being coupled to the output of the first pair of transistors; a third pair of transistors coupled between an enable signal input and the output of the second pair of transistors and having a first and a second control electrode and providing an output, the first control electrode being coupled to the precharge signal and the second control electrode being coupled to the clocking signal; an inverter having an input and an output, the input being coupled to the enable signal input; a fourth pair of transistors coupled between the first and second voltage nodes and having a first and a second control electrode and an output, the second control electrode being coupled to the output of the second pair of transistors; a fifth pair of transistors coupled between the clocking signal and the second voltage node and having a first and a second control electrode and an output, the first control electrode being coupled to the output of the third pair of transistors and the second control electrode being coupled to the output of the inverter, the output of the fifth pair of transistors being coupled to the first control electrode of the fourth pair of transistors; capacitor means coupled between the output of the fourth pair of transistors and the first control electrode of the fourth pair of transistors; a first transistor coupled from the output of the third pair of transistors and the second voltage node and having a control electrode coupled to the output of the inverter; a sixth pair of transistors coupled between the first and second voltage nodes and having a first and a second control electrode and an output, the first control electrode being coupled to the output of the fifth pair of transistors, the second control electrode being coupled to the output of the second pair of transistors; and a second transistor coupled between the output of sixth pair of transistors and the second voltage node and having a control electrode coupled to the output of the inverter.

4,291,243
CHARGE COUPLED DEVICE CHARGE COMPARATOR REFRESHER

James M. Hamilton, Hawthorne, Calif., and Craig L. Carrison, Golden Valley, Minn., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 21, 1979, Ser. No. 106,313
Int. Cl.[3] H03K 3/353; G11C 19/28; H03K 5/153; H01L 29/78
U.S. Cl. 307—304 3 Claims



1. A charge transfer device comparator refresher formed on the surface of a semiconductive substrate having a substrate electrical potential, comprising:

an input source of charge packets to be refreshed;

an output charge flow channel;

a first voltage source;

means for forming a first potential well in said substrate surface potential to store charge in said potential well, said potential well having a charge storing potential depth proportional to the voltage of said first voltage source;

means for forming a signal potential barrier in said substrate surface potential, said signal barrier having a height proportional to the size of charge packets to be refreshed from said input source;

means for forming a reference potential barrier of a selected reference height in said substrate surface potential;

means for changing the voltage of said first voltage source to eject charge stored by said potential well forming means and overflow one of said signal and reference potential barriers whenever one of said signal and reference potential barrier heights is less than the other, respectively;

means for injecting charge into said output charge flow channel in response to charge overflowing one of said reference and signal barriers wherein said means for forming a first potential well comprise a ramp electrode overlying said substrate and connected to said voltage source; and wherein said device further comprises:

an input diffusion in said substrate surface;

a drain voltage source connected to said input diffusion;

a floating diffusion in said substrate surface adjacent said ramp electrode;

a reset transistor connected between said floating diffusion and said drain voltage source;

an intermediate diffusion in said substrate surface adjacent said ramp electrode; and

an output diffusion in a portion of said substrate between said signal snd reference potential barriers.

4,291,244
ELECTRETS

William F. Beach, Bridgewater, and Dennis M. Mahoney, Long Valley, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 72,302
Int. Cl.[3] G11C 13/02; H01H 1/02
U.S. Cl. 307—400 8 Claims

1. A process for preparing polymer electrets comprising the following steps:

(a) providing two electrodes in a deposition zone, said electrodes being in a spaced relationship to one another, having opposing surfaces, and being connected to an external

voltage source capable of impressing an intense electric field between the opposing surfaces;

(b) providing a dipolar p-xylylene monomer vapor in sufficient amount to coat the opposing surfaces of the electrodes;

(c) activating the power source to provide sufficient potential to align the dipoles of the p-xylene monomer coat; and

(d) introducing the vapor from step (b) into the deposition zone, said zone being under vacuum and at a temperature at which the vapor will condense,

whereby the vapor condenses on the opposing surfaces of the electrodes, the monomer polymerizing to parylene, coating said surfaces, and forming electrets.

4. An electret comprising, in combination, a conductive metal layer coated with a film of a dipolar parylene, said parylene film having aligned electric dipoles and an external electric field.

4,291,245

ELECTRETS

Thomas E. Nowlin, Somerset, N.J., and Curt R. Raschke, Dallas, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 72,303
Int. Cl.³ G11C *13/02*
U.S. Cl. 307—400 **6 Claims**

1. A process for preparing polymer electrets comprising the following steps:

(a) providing a parylene film having one side affixed to a metal layer and grounding said metal layer;

(b) charging the free side of the film with a direct current corona, the charge being of sufficient magnitude to convert the film to an electret;

(c) providing a p-xylylene monomer vapor in sufficient amount to coat the charged film; and

(d) introducing the vapor from step (c) and the electret into a deposition zone, said zone being under vacuum and at a temperature at which the vapor will condense, whereby the electret is conformally coated with parylene.

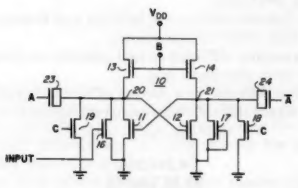
4. An electret comprising, in combination, (i) a metal layer coated with a film of parylene, said parylene film having a surface charge; (ii) an external electric field; and (iii) a conformal parylene overcoat on the charged surface.

4,291,246

DIFFERENTIAL CAPACITIVE BUFFER

William L. Martino, Jr., and Jerry D. Moench, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 5, 1979, Ser. No. 17,524
Int. Cl.³ H03K *5/01, 3/356, 17/30;* **G11C** *8/00*
U.S. Cl. 307—475 **10 Claims**



1. A buffer circuit useful in a digital memory and having a single ended input and providing complementary outputs, comprising:

a first and a second cross-coupled field effect transistor; a first load device coupled to the first transistor;

a second load device coupled to the second transistor;

an input transistor coupled in parallel to the first transistor and having a control electrode for receiving the input; and

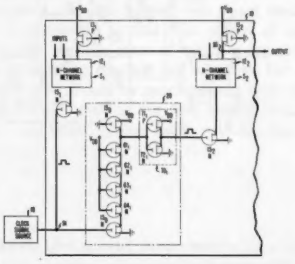
a first and a second capacitor, the first capacitor being coupled to the second transistor for applying a first control signal to the second transistor, and the second capacitor being coupled to the first transistor for applying a second control signal to the first transistor.

4,291,247

MULTISTAGE LOGIC CIRCUIT ARRANGEMENT

James A. Cooper, Jr., and Robert H. Krambeck, both of Warren, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 860,339, Dec. 14, 1977, abandoned. This application Sep. 21, 1979, Ser. No. 77,753
Int. Cl.³ H03K *19/017, 19/096*
U.S. Cl. 307—481 **6 Claims**



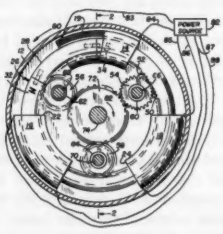
1. An electronic circuit with at least first and second stages, each of said stages including an output node and being connected between a supply voltage and a reference voltage for applying an output signal to a next consecutive stage, a logic network comprising a plurality of first active elements responsive to input signals for selectively connecting an associated one of said nodes to said reference voltage, each of said networks being connected to said reference voltage via a second active element, a load element connected between each of said nodes and said supply voltage, clock means for applying a single signal to said circuit for switching said second elements, said circuit including an on-chip delay means for avoiding premature switching of said second active element in said next consecutive stage, said first stage having a first characteristic response time, said delay means having a second characteristic response time greater than said first.

4,291,248

ELECTRIC MOTOR

Michael A. Rainbolt, Farmington, N. Mex., assignor to Rainbolt Research, Inc., Farmington, N. Mex.

Filed Dec. 26, 1978, Ser. No. 972,984
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—14 **7 Claims**



1. An electromechanical energy conversion device comprising, in combination:

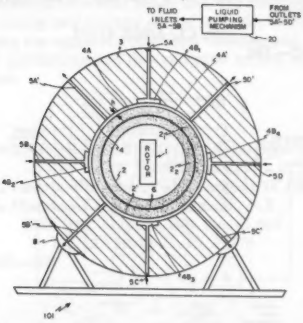
(a) housing means;

(b) three induction coils equally disposed about a circular path and affixed to said housing means forming a stator;
(c) toroidally-shaped armature means disposed within said induction coils, said armature means including only one permanent magnet and a segment of non-magnetic material, said non-magnetic material comprising 60 degrees of said toroid with said permanent magnet comprising 300 degrees of said toroid;
(d) gear means connected to said armature means by equally spaced rotatable members in contact therewith, said gear means including an output shaft operatively coupled thereto; and
(e) timing and distribution means connected to each of said coils for a predetermined time period during each cycle.

4,291,249
ROTATING ELECTRIC MACHINE WITH FLUID SUPPORTED PARTS

Joseph L. Smith, Jr., Concord, and James L. Kirtley, Jr., Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 5, 1979, Ser. No. 27,344
Int. Cl.³ H02K *3/48*
U.S. Cl. 310—214 **14 Claim**



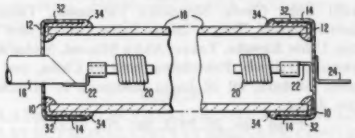
1. A rotating electric machine comprising, in combination: a rotor and a stator mounted for relative rotation therebetween, said stator comprising an armature winding, a stator core, and a frame adapted for supporting said stator core, there being a narrow gap of thickness h between at least portions of the armature winding and the stucture of the stator adjacent thereto, a viscous liquid disposed in said gap, the narrow gap of the thickness h extending over a substantial part of the winding surface; and means :o pressurize the liquid within the narrow gap, said liquid being further pressurized at local locations by virtue of relative motion that changes the gap thickness h, said pressurized liquid together with the viscosity of the liquid adapted to support said armature winding with respect to said structure adjacent thereto, said gap being maintained by the liquid with a thickness $h>0$ at all times at said local locations and at other locations during transient and steady-state loading.

4,291,250
ARC DISCHARGE TUBE END SEAL

Ranbir S. Bhalla, Pine Brook, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1979, Ser. No. 36,948
The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.
Int. Cl.³ H01J *61/30, 61/36*
U.S. Cl. 313—220 **7 Claims**

1. A sealed high pressure sodium discharge lamp arc tube, said arc tube comprising:
an elongated alumina arc tube body;
a refractory metal end cap associated with each end of said arc tube body; and
means sealing said end caps to the ends of said arc tube body, said means sealing said end caps to said ends of said arc

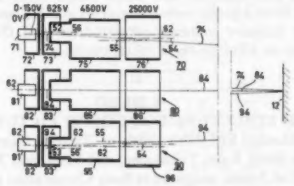


tube body including a coating of a refractory metal silicide on the interior surface of said refractory metal end caps and a glassy sealing frit principally comprising alumina and calcia interposed between said refractory metal silicide coating and said alumina arc tube body.

4,291,251
COLOR DISPLAY TUBE

Bijma, Eindhoven, Netherlands; Helmut Joeres, Aachen, ed. Rep. of Germany, and Johannes H. M. Johanns, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,440
Claims priority, application Netherlands, Sep. 8, 1978, 7809160
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—413 **2 Claims**



1. An electric discharge tube comprising an envelope having a main axis, a display screen and an electron gun system for producing a plurality of electron beams and converging the beams on the display screen, the electron gun system comprising first electrode means for generating the electron beams, the first electrode means being situated along axes parallel to the main axis of said tube; second electrode means situated along the path of the electron beams between the first electrode means and the display screen, said second electrode means comprising respective last electrodes situated on the side toward the dislay screen and an associated preceding electrode, with electrodes in use constitute a lens field which focuses the electron beams symmetrically; and third electrode means between the first and the second electrode means for forming an asymmetric lens field to coverge the electron beams on the display screen, characterized in that
the axes of the electrodes of all electrode means are parallel to said axes of the first electrode means; and
the last electrodes (**76, 96, 106**), situated on the side toward the display screen, of those second electrode means which are situated eccentrically with respect to the main axis of the tube, have axes (**54**) which are situated eccentrically with respect to the axes (**55**) of the associated preceding electrodes (**75, 95, 105**) and to the axes (**62**) of the associated first electrode means, the axes (**55**) of said preceding electrodes (**75, 95, 105**) having a smaller distance to the main axis of the tube than the axes (**54**) of the associated last electrodes (**76, 96, 106**) situated on the side toward the display screen, said axes (**54**) of said last electrodes in turn having a smaller distance to the main axis of the tube than

the axes (62) of the associated first electrode means (71, 72, 73, 91, 92, 93).

4,291,252

ELECTRON TUBE CATHODE

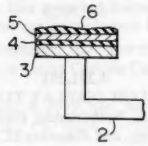
Toshiyuki Aida, Chofu; Shigehiko Yamamoto, Tokorozawa; Sadanori Taguchi, Tokyo; Isamu Yuito, Ome; Yukio Honda, Fuchu; Ushio Kawabe, Tokyo; Akira Misumi, Mobara; Takao Kawamura; Hiroshi Fukushima, both of Chiba, and Yoshio Degawa, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1979, Ser. No. 95,933

Claims priority, application Japan, Nov. 29, 1978, 53-146488

Int. Cl.³ H01J *1/14, 19/06;* **H01K** *1/04*

U.S. Cl. 313—346 R **8 Claims**



1. An electron tube cathode comprising a base metal of Ni alloy containing W solved therein up to its solubility limit and a reducing impurity of small amount, a layer of an oxide of metal provided on said base metal including at least one material selected from a group consisting of Zr and Hf, a thin film of metal provided on said metal oxide layer including one selected from a group consisting of Pt and Re, and a coating of electron emissive material provided on said thin metal film including an alkaline earth metal oxide.

4,291,253

GRID STRUCTURE FOR COLOR PICTURE TUBE

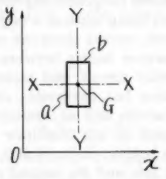
Akio Ohkoshi; Eiji Ishii, both of Tokyo; Akira Nakayama, Fuchu; Shoji Kato, Yokohama, and Yoshiyuki Tanaka, Koganei, all of Japan, assignors to Sony Corporation and Sumitomo Metal Mining Co., Ltd., both of Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,377

Claims priority, application Japan, Sep. 30, 1977, 52-118425

Int. Cl.³ H01J *1/46, 29/07*

U.S. Cl. 313—348 **15 Claims**



1. A grid structure for a color picture tube, comprising:

a pair of elongated frame elements disposed in substantially parallel, spaced apart relation;

a pair of mechanically resilient brace members extending between said frame elements for maintaining the latter in said spaced apart relation;

means defining a plurality of grid wires with slits therebetween which extend between said frame elements and which are affixed to the latter adjacent the opposite ends of the grid wires with said brace members being prestressed so as to urge said frame elements away from each other and thereby longitudinally tension said grid wires;

each of said brace members including a mid-portion and end portions extending from the latter and being affixed to said frame elements at locations on the latter spaced inwardly from respective ends of said frame elements, each of said brace members further having a cross-sectional shape with different section moduli in respect to correspondingly different axes passing through the centroid of said cross-sectional shape, said mid-portion of each of the brace members being disposed so that an axis of said cross-sectional shape which passes through said centroid at right angles to the axis about which there is a maximum section modulus of said cross-sectional shape is disposed in a plane which contains the lines of action of forces acting on said frame elements at predetermined points adjacent the respective end portions of the frame elements.

4,291,254

DISCHARGE LAMP ENERGIZATION CIRCUIT, PARTICULARLY FOR AUDIO AND SUPERSONIC FREQUENCY OPERATION OF HIGH-PRESSURE DISCHARGE LAMPS

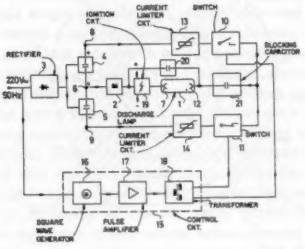
Joachim Arlt, Munich, and Dietrich Fromm, Warngau, both of Fed. Rep. of Germany, assignors to Patent-und-Gesellschaft für elektrische Glühlampen m.b.H., Munich, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,372

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909605

Int. Cl.³ H05B *41/36*

U.S. Cl. 315—240 **18 Claims**



1. Discharge lamp energization circuit to energize a lamp (1) with alternating current at a frequency high with respect to power line frequency (50, 60 Hz) having

an inductance (2) serially connected to a terminal (7) of the lamp (1) and forming a series circuit therewith, and means (3) supplying a d-c voltage to operate the lamp,

and comprising, in accordance with the invention,

two capacitors (4, 5) of equal capacity value, serially connected across the d-c voltage supply (3), the series circuit of the inductance (2) and the lamp (1) being connected to the junction (6) of the serially connected capacitors;

a first electronically controlled switch (10) connected to the free terminal (8) of one capacitor (4);

a second electronically controlled switch (11) connected to the free terminal (9) of the other capacitor (5),

said switches being connected to the other lamp terminal (12) forming the free terminal of the series circuit;

and a timing control circuit (15) connected to and controlling both said switches to be alternately conductive,

the timing control circuit providing a frequency-stable output control signal to said switches at a frequency matched to a certain operating frequency of the lamp (1) and controlling the electronically controlled switches to essentially instantaneous conduction and cut-off, respectively, and providing an essentially square-wave voltage to said electronically controlled switches at said frequency matched to the lamp operating frequency, and thus supplying a-c square-wave voltage to the lamp circuit.

4,291,255

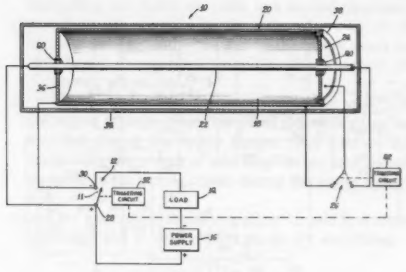
PLASMA SWITCH

Igor Alexeff, 1907 Holston River Rd., Knoxville, Tenn. 37914

Filed Aug. 17, 1979, Ser. No. 67,467

Int. Cl.³ H01J *11/04, 13/48;* **H05B** *37/00, 39/00, 41/00*

U.S. Cl. 315—340 **9 Claims**



1. A plasma switch including means for defining a substantially evacuated chamber, a tubular cathode disposed within said chamber, an elongated anode disposed within said cathode, a first conductive end plate disposed at one end of said cathode insulated from said anode and said cathode and substantially closing said one end of said cathode, means substantially closing the opposite end of said cathode, and means for selectively connecting said first end plate to said anode or to said cathode.

4,291,256

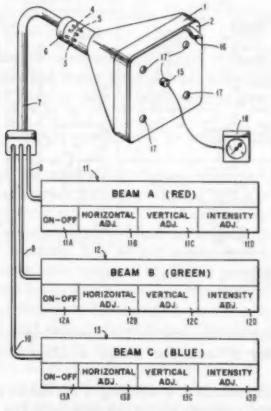
ALIGNMENT OR CORRECTION OF ENERGY BEAM TYPE DISPLAYS

Richard L. Garwin, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,609

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—368 **9 Claims**



1. In the process of correction or alignment of a display of the type where multiple electronically driven independent energy source beams interact at a plurality of closely adjacent display spots on a viewing surface the improvement performable at at least one of a plurality of locations over said viewing surface comprising the steps of:

identifying an accurately positioned location on the viewing surface of said display;

positioning a photodetector adapted for sensing of the order of only a single display spot out of said plurality of closely adjacent display spots at said identified location on said viewing surface;

directing the position of a first of said energy source beams to said photodetector while simultaneously disabling each remaining said energy source beam and thereafter serially directing the position of each remaining said energy source beam individually to said photodetector while simultaneously disabling each other said energy source beam.

4,291,257

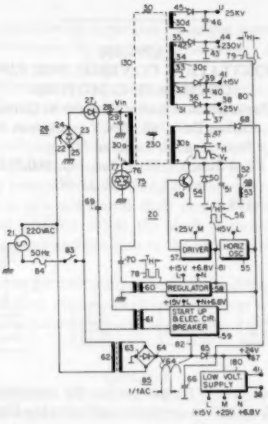
REGULATED DEFLECTION CIRCUIT WITH START-UP AND ELECTRONIC CIRCUIT BREAKER CONTROL

Walter Böhringer, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jul. 14, 1980, Ser. No. 167,996

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—408 **17 Claims**



1. A regulated deflection circuit with start-up circuitry, comprising:

a deflection winding;

a deflection generator coupled to said deflection winding for generating scanning current in said deflection winding, a deflection rate voltage with an alternating polarity component voltage being developed at a deflection generator terminal;

a source of supply frequency alternating polarity voltage;

a controllable regulator switch;

an input transformer with first and second windings, said first winding being coupled to said source and to said regulator switch for transferring energy from said source to a load circuit coupled to a winding of said input transformer other than said first winding in accordance with the conduction time of said regulator switch, said second winding being coupled to said deflection generator terminal;

a regulator control circuit coupled to said regulator switch for turning on said regulator switch at a controlled instant within a first polarity interval of said deflection rate alternating polarity component voltage to draw current in said first winding from said source, said deflection rate alternating polarity component voltage being applied to said second winding for reflecting a resonant current to said first winding to commutate off said regulator switch during the alternate polarity interval;

means for developing a signal representative of variations of a deflection circuit energy level;

means for applying said deflection circuit energy level varia-

tions representative signal to said regulator control circuit to vary said conduction time of said regulator switch with deflection circuit energy level variations;

a second controllable switch coupled in the path of current from said source to said first winding of said input transformer;

a second control circuit coupled to said second switch for generating a second switch turn-on signal to enable current from said source to flow in said first winding of said input transformer;

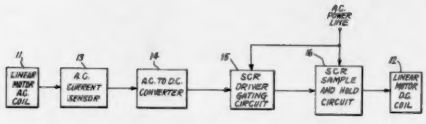
means coupled to said second control circuit and responsive to said supply frequency alternating polarity voltage for enabling said second control circuit to generate said second switch turn-on signal at an instant prior to a zero-crossover instant within a cycle of said supply frequency alternating polarity voltage during deflection circuit start-up prior to steady-state operation; and

means for phase advancing the occurrence of said second switch turn-on signal from said zero-crossover instant during the transition from start-up to steady-state operation.

4,291,258
DC EXCITATION CONTROL FOR LINEAR OSCILLATING MOTORS

Howard L. Clark, Ballston Lake; Richard A. Dorman, Troy, and Paul Back, Clifton Park, all of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,305
Int. Cl.³ H02K *33/00*
U.S. Cl. 318—124 **11 Claims**



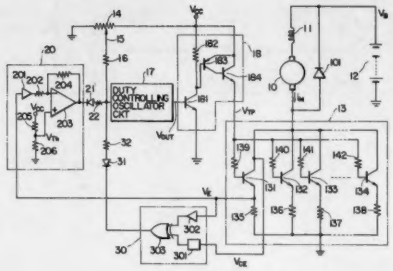
1. A control system for proportionally controlling the magnitude of DC excitation current supplied to the DC field coil of a linear reciprocating motor in quasi-proportion to the magnitude of the AC excitation current supplied to the AC field coil of the motor; said control system comprising AC coil current sensing means for sensing the magnitude of the AC current flowing in the AC coils of the linear reciprocating motor and deriving a control signal voltage representative of the magnitude of the AC coil current, and means responsive to the control signal voltage for deriving an output DC coil excitation current which is quasi-proportional to the magnitude of the AC coil excitation current for supply to the DC field coil of the linear motor.

4,291,259
CONTROL APPARATUS FOR CONTROLLING TRANSISTOR CHOPPER FOR USE IN CURRENT SUPPLY FOR ELECTRIC MOTOR

Katsuji Marumoto, and Tsutomu Ohmae, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 101,844
Claims priority, application Japan, Dec. 8, 1978, 53-151145
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—139 **21 Claims**

1. A control apparatus for controlling the supply of current for an electric motor, comprising a source for supplying direct current to the motor; transistor chopper circuit means, including a plurality of power switching transistors connected in parallel, which is series connected with said direct current source for controlling the current to be supplied to the electric motor; means for producing a command signal representing the desired speed of said motor; duty controlling oscillator circuit means for generating an output signal on the basis of the command signal from said command signal producing means, by which the duty factor of the current supplied for the electric motor via said transistor chopper circuit means is determined by controlling the ON-OFF operation of said transistor chopper circuit means on the basis of said output signal; means connected to a preselected one of said plurality of power transistors for detecting the amplitude of current flowing

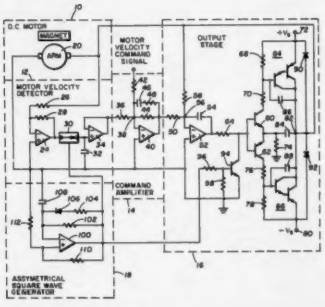


therethrough; and limiter circuit means for controlling said duty controlling oscillator circuit means in response to the output from said current detecting means, whereby the duty factor of the current supplied for the electric motor is regulated in dependence on the amplitude of the current flowing through said preselected one of said plurality of power transistors of said chopper circuit means.

4,291,260
MOTOR VELOCITY CONTROL SERVO AMPLIFIER

John M. Nixon, 902 NW. 4th Ave., Mineral Wells, Tex. 76067

Continuation of Ser. No. 897,200, Apr. 17, 1978. This application Jan. 28, 1980, Ser. No. 115,753
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—331 **5 Claims**



1. A sampling servo amplifier for controlling the velocity of a motor having at least one motor winding, comprising in combination:

first means connected to a winding of the motor and generating a motor velocity signal varying with the motor back emf, said first means including means for storing the motor velocity signal during a motor sample time interval, and further including first switching means for connecting the motor velocity signal to said means for storing in response to a timing signal during the motor sample time interval,

means for combining the motor velocity signal and a motor command signal into a motor drive voltage,

an amplifier responsive to the motor drive signal for generating a voltage during the motor drive time having an amplitude varying with the amplitude of the motor drive signal,

a first power amplifier connected to a first voltage for energizing the motor to rotate in a first direction,

a first switch actuated by the motor drive signal of said amplifier of a first sense during the motor drive time to turn on said first power amplifier to connect the first voltage to the motor,

a second power amplifier connected to a second voltage for energizing the motor to rotate in a second direction,

a second switch actuated by the motor drive signal of said amplifier of a second sense during the motor drive time to turn on said second power amplifier to connect the second voltage to the motor,

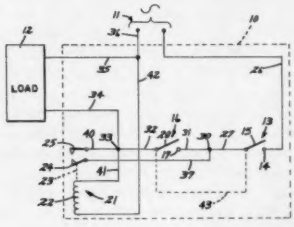
second switching means for interrupting the application of the output voltage of said amplifier to said first and second switches during the motor sample time interval and for connecting the output of said amplifier to said switches in response to the timing signal during the motor drive time, and

means for generating the timing signal to said first means for switching and to said second means for switching.

4,291,261
ELECTRICAL LOAD CONTROL CIRCUIT USEFUL IN LIQUID LEVEL CONTROL SYSTEMS

Stephen P. Johnston, Detroit Lakes, Minn., assignor to S. J. Electro Systems, Inc., Detroit Lakes, Minn.

Filed Nov. 21, 1979, Ser. No. 96,550
Int. Cl.³ G05B 5/00
U.S. Cl. 318—482 **4 Claims**



1. Apparatus for maintaining the level of liquid in a chamber between upper and lower levels, comprising, in combination:

a pump for causing flow of liquid with respect to the chamber;

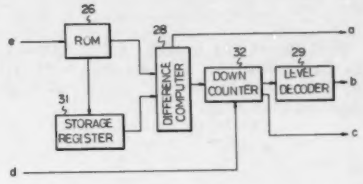
an electric motor energizable to cause operation of said pump;

and means for controlling the energization of said motor including a relay, having a winding and a set of normally open contacts which are closed and opened, after short delays, upon energization and deenergization respectively of said winding, first switch means and second switch means responsive respectively to the presence of liquid at upper and lower levels in said chamber, first circuit means for supplying electrical energy from a source to said winding and said motor through said first switch means and said second switch means in series, and a second circuit means for supplying electrical energy from said source to said motor and said winding through one of said first and second switch means and said contacts of said relay, said second circuit means connecting said contacts in parallel with the other of said first and second switch means, so that initial energization of said motor and relay as said liquid reaches one of said levels is accomplished by the closing of said first and second switch means in series and initial deenergization of said motor and relay as said liquid reaches the other of said levels is accomplished by the opening of said one of said switch means, with both said energization and deenergization occurring during said delays by said switch means rather than by said contacts.

4,291,262
SERVO POSITIONING APPARATUS

Yoshinori Nakajima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 29, 1979, Ser. No. 88,805
Claims priority, application Japan, Nov. 14, 1978, 53-140145
Int. Cl.³ G05B 19/28
U.S. Cl. 318—603 **8 Claims**



1. A servo positioning apparatus including a motor having a shaft and drive means for applying drive power to the motor, characterized by comprising:

position difference storage means for storing a present position difference between a previous command shaft position and a present command shaft position, the drive means applying drive power to the motor in accordance with the present position difference;

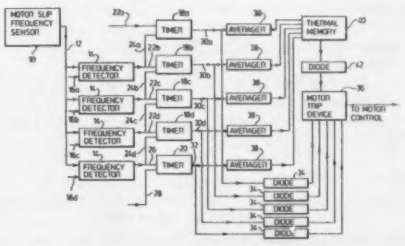
computing means for computing a new position difference between a new command shaft position and the present command position while the shaft is moving from the previous command position to the present command position; and

control means for controlling the position difference storage means to store the new position difference when the shaft reaches the present command position.

4,291,263
AMORTISSEUR WINDING PROTECTION SYSTEM

Andrew C. Stevenson; Gordon W. Herzog, both of Peterborough, and James C. Murdoch, Cavan, all of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Sep. 17, 1979, Ser. No. 76,214
Claims priority, application Canada, Mar. 9, 1979, 323159
Int. Cl.³ H02H 7/08
U.S. Cl. 318—706 **10 Claims**



5. An apparatus for protecting an amortisseur winding during starting of a synchronous motor, said motor having a safe-time within which said motor accelerates to a speed near synchronous speed without damaging said winding, comprising:

means sensing a characteristic of achieved motor speed,

timing means providing a plurality of timing segments which measure succeeding periods of time within said safe-time,

comparing means associating with each timing segment a characteristic of desired motor speed above which said

motor is required to accelerate prior to said timing segment expiring, said comparing means comparing said achieved characteristic and said desired characteristic of each timing segment so as to detect when achieved motor speed exceeds desired motor speed, and

said timing means responsive to said comparing means stopping said motor upon failure of said comparing means to detect the achieved motor speed exceeding the desired motor speed prior to expiration of said desired characteristic's associated timing segment.

4,291,264

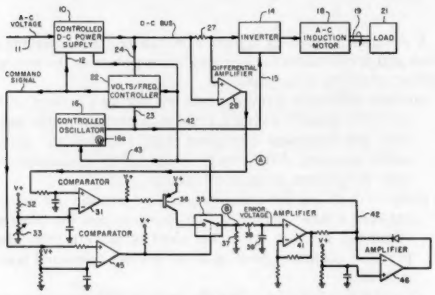
POWER FACTOR CONTROL SYSTEM FOR INVERTER-DRIVEN A-C INDUCTION MOTOR

Edward C. Siemon, Newfield, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 4, 1979, Ser. No. 72,523

Int. Cl.³ H02P *1/24, 1/42, 3/18, 5/28*

U.S. Cl. 318—729 **9 Claims**



1. A control system for controlling the power factor in an a-c induction motor driven by the output a-c voltage from an inverter which in turn is energized by a d-c voltage received over a d-c bus from a d-c power supply, the d-c bus current alternately flowing through the inverter to the motor as real current and back from the motor and through the inverter to the d-c power supply as reactive current, said control system comprising:

means for sensing the d-c bus current and developing therefrom an alternating voltage which varies around a zero axis and reflects the actual power factor in the induction motor, the voltage above the zero axis representing the real current to the motor while the voltage below the axis represents the reactive current from the motor;

means for providing a reference voltage representing the desired power factor in the induction motor;

means for comparing said alternating voltage with said reference voltage to produce an error voltage which varies as a function of the difference between the desired power factor and the actual power factor;

and control means responsive to said error voltage for varying the amplitude of the a-c inverter voltage to change the reactive power in order to maintain the desired power factor.

4,291,265

PROTECTIVE SYSTEM FOR INVERTER CIRCUIT USED IN DRIVING AC MOTORS

Shigeki Kawada, Hino; Hiroshi Ishida, Hamura, and Keiji Sakamoto, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Oct. 31, 1979, Ser. No. 89,735

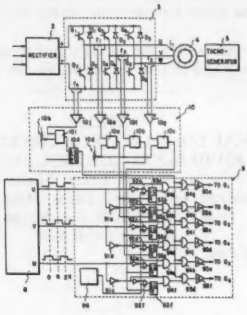
Claims priority, application Japan, Nov. 4, 1978, 53/136067

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—782 **6 Claims**

1. In a protective system for an inverter circuit used in driving an AC motor, which system includes an inverter circuit for converting a direct current into a three-phase alternating current in the form of a rectangular wave by the switching action of transistors, three-phase rectangular signal generating means for generating a three-phase rectangular signal of a frequency in accordance with a deviation between an instructed speed and an actual speed, and an inverter drive circuit which receives the three-phase rectangular signal to regulate the output frequency of the inverter circuit to a prescribed value, the AC motor being made to rotate by the alternating current supplied by the inverter circuit, the improvement comprising:

first current detection means for detecting a maximum rated current flowing through the transistors which constitute the inverter circuit, the operation of the inverter circuit being terminated when said first current detection means responds upon detecting the maximum rated current; and



second detection means, provided for each of the three phases, for detecting a fixed overcurrent value in each of the three phases, which overcurrent value is less than the value of the maximum rated current, wherein when said second current detection means for a given one of the three phases responds upon detecting the fixed overcurrent value, only that transistor in the inverter circuit corresponding to said given phase is switched on and off at a fixed period to chop only the primary voltage of said given phase, whereby the current flowing through the transistor corresponding to said given phase is limited to a value which is less than the fixed overcurrent value.

4,291,266

DEVICE FOR CHARGING AN ACCUMULATOR FROM AN ELECTRICAL ENERGY SOURCE MORE PARTICULARLY FOR AN ELECTRONIC WATCH

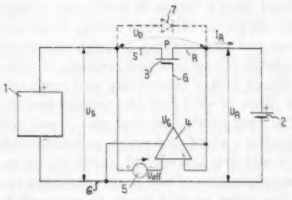
Hubert Portmann, Colombier, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland

Filed May 8, 1979, Ser. No. 36,984

Claims priority, application Switzerland, May 8, 1978, 4957/78

Int. Cl.³ H02J *7/10;* **G04C** *3/00*

U.S. Cl. 320—2 **5 Claims**



1. An electronic device for the charging of an accumulator from a source of electrical energy, for use, more particularly,

in an electronic watch, said accumulator and said energy source each having a first and a second pole, said second poles being connected together, comprising conducting means having a control electrode and two main electrodes connected respectively to said first poles of the energy source and the accumulator; a differential amplifier having two inputs respectively coupled to said main electrodes and an output connected to said control electrode, said amplifier responding to the potential difference between the first poles of said energy source and said accumulator for controlling the conduction of said conducting means; and means for adjusting the off-set voltage of said differential amplifier at a predetermined value and polarity, in order to render negligible the voltage drop in said conducting means and to avoid the discharge of said accumulator into said energy source.

4,291,267

METHOD AND APPARATUS FOR TESTING THE INTEGRITY OF THE ELECTRICAL INSULATION OF A WELL LOGGING SONDE

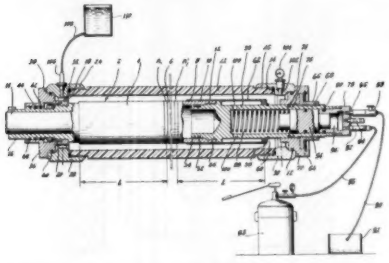
Jean L. Bonnet, Chatenay Malabry, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,822

Claims priority, application France, Oct. 28, 1977, 77 32583

Int. Cl.³ G01R *31/16, 31/02*

U.S. Cl. 324—54 **31 Claims**



1. Apparatus, for testing the integrity of the electrical insulation of a logging sonde having a plurality of electrodes in order to measure the electrical resistivity of earth formations traverse by a borehole, said sonde being adapted to be lowered into said borehole, comprising:

an enclosure capable of containing a fluid introduced therein;

means connecting said sonde to said enclosure for positioning selected ones of said electrodes within said interior;

means communicating with said interior for introducing within said enclosure, between said sonde and said enclosure, a conductive fluid, said enclosure and said connecting means being so constructed and arranged that electrical conduction paths are capable of being established through said fluid and said enclosure; and

means for effecting electrical communication between respective ones of said electrodes and the environment exterior of said enclosure in order to accommodate a measurement of parameters associated with the operation of said sonde within said enclosure and said fluid such as to permit the derivation therefrom of an indication of the integrity of said electrical insulation.

4,291,268

APPARATUS FOR DRIVING A DEFLECTING COIL TYPE METER

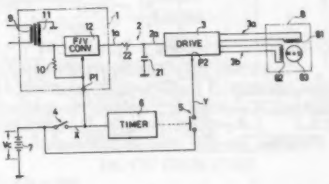
Hideo Okuyama, Omiya, Japan, assignor to Kanto Seiki Company, Limited, Omiya, Japan

Filed Oct. 25, 1979, Ser. No. 88,129

Claims priority, application Japan, Oct. 27, 1978, 53-148056[U]

Int. Cl.³ G01R *19/00, 7/08*

U.S. Cl. 324—76 R **7 Claims**



1. Apparatus for driving a deflecting coil type meter having a pair of coil windings angularly positioned with respect to each other, a magnetic rotor pivotally mounted so as to rotate under the influence of the resultant magnetic field produced by said coil windings, a pointer mechanically connected to said magnetic rotor and having an initial position, and a calibrated dial scale to which deflection of said pointer can be referred, which apparatus comprising:

(a) a power switch connected to a power supply;

(b) means for gradually decreasing the voltage of an input signal when said power switch is turned off, said input signal carrying information to be indicated by said meter, so that said coil windings receive said gradually decreasing input signal after said power switch is turned off;

(c) a driving stage responsive to the output signal of said means, for producing driving currents which are applied to said coil windings;

(d) a timer circuit responsive to the voltage applied through said power switch for producing an output signal during the time that said power switch is on and for a predetermined interval after said power switch is turned off; and

(e) switching means for supplying said driving stage with electrical power in accordance with said output signal of said timer circuit to rotate said magnetic rotor to cause said pointer to return to its initial position after said power switch is turned off.

4,291,269

SYSTEM AND METHOD FOR FREQUENCY DISCRIMINATION

Edward J. Nossen, Camden, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,733

Int. Cl.³ G01R *23/14*

U.S. Cl. 324—79 D **15 Claims**

1. A system for determining the frequency of an input signal received during a time period T and comprising:

means for digitizing said input signal at a bit rate f_c and for storing the digitized bits of said input signal during said time period T;

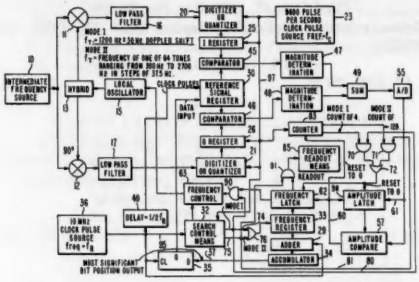
means for generating a successive series of digitized reference signals whose frequencies are represented by different patterns of binary 1's and 0's, with said frequencies being spaced apart by predetermined frequency intervals and including a reference signal having the same frequency as that of said received signal;

reference register means;

means for clocking said series of digitized reference signals into said reference register means during said time period T;

means for comparing the stored digitized input signal with

successive reference signals entered into said reference register means to produce output signals whose magnitudes are proportional to the degree of correlation therebetween; and



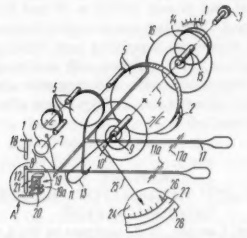
means for determining the largest output signal and the frequency of the particular reference signal which resulted in said largest output signal.

4,291,270

APPARATUS WITH A PERMANENT MAGNET FOR GAUGING THE THICKNESS OF COATINGS ON METAL PRODUCTS WITH MAGNETIC SHUNT TO ADJUST FOR DEMAGNETIZATION OF THE PERMANENT MAGNET

Alexandr A. Lukhvich, ulitsa A. Kulman, 15, kv. 18; Valery A. Rudnitsky, ulitsa Slavinskogo, 35, kv. 36; Ivan I. Linnik, prospekt Partizansky, 32, korpus 1, kv. 91, and Genrikh B. Gavris, Leninsky prospekt, 127, kv. 265, all of Minsk, U.S.S.R.

Filed Apr. 4, 1979, Ser. No. 27,071
Claims priority, application U.S.S.R., Apr. 4, 1978, 2598349
Int. Cl.[3] G01B *7/10*; G01R *33/12*
U.S. Cl. 324—230 **3 Claims**



1. An apparatus for gauging the thickness of coatings on metal products, comprising:

a casing;

a wheel system including shafts mounted in said casing;

spring actuator means linked to said wheel system for rotating said wheel system;

means for winding said spring actuator means;

a permanent magnet for gauging the thickness of coatings on metal products effected through interaction of its magnetic field with a ferromagnetic coating on the product or with a metallic base of a product having a nonmagnetic coating;

two levers independently balanced in a static state;

a first of said levers carrying said permanent magnet;

a second of said levers interacting with said first lever when the force of the latter necessary to break away the permanent magnet from the product being gauged is insufficient;

two coiled springs;

a first of said coiled springs being connected through one end thereof with said first lever and through its second end with one of the shafts of said wheel system;

spring tensioning control means for controlling the tension of a second of said coiled springs, the second spring being connected through one end thereof with said second lever and through the other end with the spring tensioning control means;

a magnetic element attached to said casing and adapted to attract said permanent magnet after it has broken away from the product being gauged;

a reset lever for returning said first lever to an initial position, said reset lever being rigidly fixed to a central shaft of said wheel system;

an adjusting shunt mounted in the said casing for movement along said permanent magnet, said shunt correcting the attractive force of said magnet to thereby adjust for demagnetization of the permanent magnet;

a round scale secured to said casing;

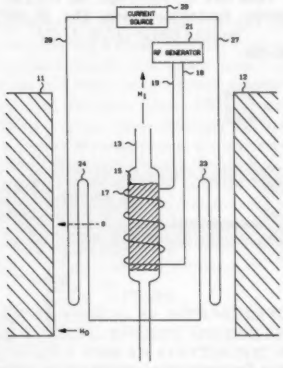
a pointer fixed on the central shaft of said wheel system for providing thickness indication on said round scale.

4,291,271

METHOD FOR DETERMINING PORE SIZE DISTRIBUTION AND FLUID DISTRIBUTION IN POROUS MEDIA

Donald E. Lauffer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 1, 1979, Ser. No. 90,180
Int. Cl.[3] G01N *27/00*
U.S. Cl. 324—307 **21 Claims**



1. A method for determining the pore size distribution of a porous media comprising the steps of:

(a) substantially saturating a sample of said porous media with a fluid which exhibits a response in a nuclear magnetic resonance spectrometer;

(b) positioning the thus saturated sample in a static magnetic field H_o and a magnetic field gradient G which is superpositioned on said static magnetic field H_o;

(c) subjecting the thus positioned sample to a first radiofrequency pulse at a time t_1 to thereby rotate the precessing nuclear magnets associated with the fluid in said sample approximately 90° to generally the positive Y-axis of a reference frame which is rotating around the direction of the static magnetic field H_o where the direction of the static magnetic field H_o is the positive Z axis of said reference frame and the direction of the alternating magnetic field H_1 produced by said first radio frequency pulse is the positive X axis of said reference frame;

(d) subjecting the thus treated sample to a second radio frequency pulse at a time t_2, which is later in time that said time t_1, to thereby rotate said precessing nuclear magnets

approximately another 90° to generally the X-Z plane of said reference frame;

(e) subjecting the thus treated sample to a third radiofrequency pulse at a time t_3, which is later in time than said time t_2, to thereby rotate said precessing nuclear magnets approximately another 90° to generally the X-Y plane of said reference frame;

(f) measuring, by means of a nuclear magnetic spectrometer, the amplitude of the spin echo signal which occurs when the magnetization of said precessing nuclear magnets refocuses on generally the negative Y-axis of said reference frame after said time t_3;

(g) changing the magnetic field gradient G to a different magnitude;

(h) repeating steps c–g to obtain a plurality of spin echo amplitudes as a function of the magnitude of the magnetic field gradient G; and

(i) determining the pore size distribution of said sample based on the plurality of spin echo amplitudes which are a function of the magnetic field gradient G.

4,291,272

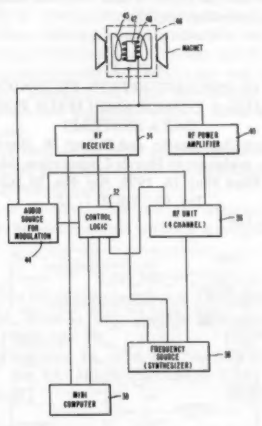
METHOD FOR REDUCING HOMONUCLEAR BROADENING IN MAGNETIC RESONANCE SPECTRA OF SOLIDS

Donald C. Hofer, Hopewell Junction, N.Y.; Raymond D. Kendrick, San Jose, and Costantino S. Yannoni, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,254

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—313 **6 Claims**



1. In a method of operation of a magnetic resonance spectrometer employing a Zeeman field and at least one orthogonal radio frequency (rf) field for energization of the material, the improvement comprising:

varying the Zeeman field to produce a sinusoidal off-resonance component of the Zeeman field of amplitude

$$\beta \frac{\omega_a}{\gamma} / \sqrt{3}$$

and of frequency ω_a;

where ω_a is a constant which is large with respect to the width of an NMR line of the material and β is a constant;

applying a first rf field normal to said off-resonance component of the Zeeman field and modulating the amplitude of said rf field to produce a sinusoidal envelope of amplitude

$$\frac{\sqrt{2}}{\sqrt{3}} \beta \frac{\omega_a}{\gamma}$$

and of frequency ω_a;

selecting β such that $J_0(2\beta) = -2J_0(\beta) \approx 0$;

by eliminating said first rf field for about 2 to 5 microseconds at or about the zero crossing of said sinusoidal envelope once per audio cycle to introduce discontinuities therein; and

employing said discontinuities for observation windows for the NMR signals.

4,291,273

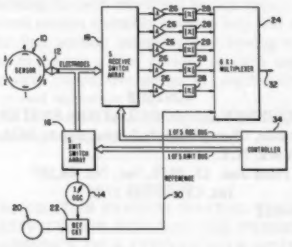
FLOW REGIME DETECTING

Ronald L. Dechene, Boxford; Frank G. Grimaldi, and Robert E. Newton, both of Tewksbury, all of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Filed Jun. 14, 1979, Ser. No. 48,765

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—343 **4 Claims**



1. Method of determining phase cross-section distribution of mixed phase fluids comprising,

establishing a cyclically rotating pattern of substantially limited, to less than full cross section, diametral and chord voltage fields and measuring the diametral and chord conductances under said voltage fields,

establishing ratios of essentially simultaneous diametral and chord conductances,

providing a signal based on said ratios.

4,291,274

PHASE DETECTOR CIRCUIT USING LOGIC GATES

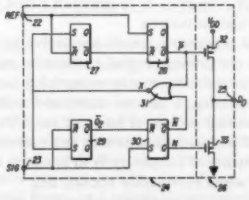
Yasoji Suzuki, Ayase, and Nobuyuki Kamimaru, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 20, 1979, Ser. No. 96,056

Claims priority, application Japan, Nov. 22, 1978, 53-144611; Jun. 29, 1979, 54-81459

Int. Cl.³ H03D *13/00*; H03K *5/26*

U.S. Cl. 328—133 **5 Claims**



1. A phase detector circuit comprising:

two input terminals at which input signals are applied;

two output terminals at which output signals relative to the phases of the input signals are produced;

a first dominant type flip-flop circuit connected to one input terminal and whose output signal is transferred to one output terminal;

a second dominant type flip-flop circuit connected to the other input terminal and whose output signal is transferred to the other output terminal;

a third flip-flop circuit connected to one input terminal and whose output signal is transferred to the first dominant type flip-flop circuit;

a fourth flip-flop circuit connected to the other input terminal and whose output signal is transferred to the second dominant type flip-flop circuit;

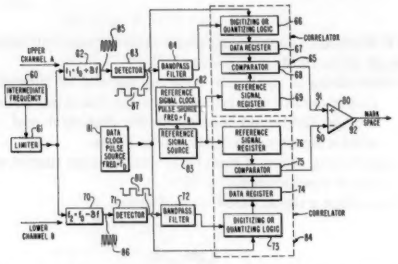
gate means for receiving the output signals of the first and second dominant type flip-flop circuits and whose output signal is applied to the third and fourth flip-flop circuits.

4,291,275

FREQUENCY DEMODULATION SYSTEM

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 13, 1979, Ser. No. 48,167
Int. Cl.³ H03D *3/00*
U.S. Cl. 329—112 **7 Claims**



1. Means for demodulating a received encoded signal encoded with at least one predetermined pattern of successive signal segments of frequencies f_1 and f_2, and comprising:

first signal processing means responsive to said encoded signal and comprising first correlation means;

said first correlation means comprising first register means containing a first staticized reference signal having a first pattern of binary 1's and 0's correlative with the signal segments of frequency f_1 to produce a first output signal when correlation occurs;

second signal processing means responsive to said encoded signal and comprising second correlation means;

said second correlation means comprising second register means containing a second staticized reference signal having a second pattern of binary 1's and 0's complementary to said first staticized pattern and correlative with the signal segments of frequency f_2 to produce a second output signal when correlation occurs; and

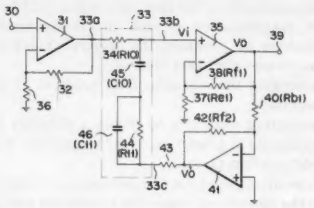
means for combining said first and second output signals to produce a resultant output signal indicating correlation with said at least one pattern of signal segments.

4,291,276

EQUALIZER AMPLIFIER

Masaru Ida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 5, 1979, Ser. No. 91,484
Claims priority, application Japan, Nov. 16, 1978, 53-157836
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—85 **8 Claims**



1. An equalizer amplifier circuit comprising:

an RC circuit having frequency characteristics substantially identical with the RIAA reproduction characteristics, said RC circuit including: a first terminal to receive an input signal; a second terminal to deliver an output signal; and a third terminal;

a first amplifier having: an input coupled to said second terminal of said RC circuit; and an output; and

a second amplifier having: an input coupled to said output of said first amplifier; and an output coupled to said third terminal of said RC circuit;

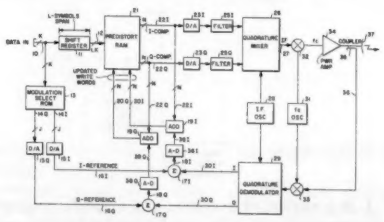
one of said first and second amplifiers being a noninverting amplifier and the other of said first and second amplifiers being an inverting amplifier.

4,291,277

ADAPTIVE PREDISTORTION TECHNIQUE FOR LINEARIZING A POWER AMPLIFIER FOR DIGITAL DATA SYSTEMS

Robert C. Davis, Indialantic, and Robert W. Boyd, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 16, 1979, Ser. No. 39,362
Int. Cl.³ H03F *1/32*
U.S. Cl. 330—149 **17 Claims**



1. In a communication system wherein signals to be transmitted are coupled through a modulation distorting amplifier that subjects the signals to shifts in signal characteristics away from their intended values, an arrangement for compensating for the distorting action of said amplifier comprising:

first means, coupled to receive input signals representative of data to be transmitted, for generating first output signals representative of the intended output of said amplifier in the absence of its distortion action;

second means, coupled to receive said input signals, for storing predistored modulation signals to be coupled through said amplifier in response to said input signals, said predistortion signals having characteristics such that the distortion action of said amplifier is compensated thereby; and

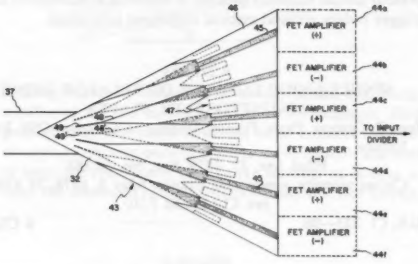
third menas, coupled to said first and second means and to the output of said amplifier, for modifying predistorted modulation signals stored in said second means, in response to changes in the distortion action of said amplifier.

4,291,278

PLANAR MICROWAVE INTEGRATED CIRCUIT POWER COMBINER

John P. Quine, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 12, 1980, Ser. No. 148,790
Int. Cl.[3] H03F *3/60, 3/68;* **H01P** *1/16, 1/162*
U.S. Cl. 330—286 **16 Claims**



1. A microwave power combiner comprising:

a dielectric substrate having metallization patterns on both sides which form an array of fin-line transitions from microstrip to waveguide, said patterns having plural microstrip lines with a given characteristic impedance and an opposing continuous ground plane which transition to an unbalanced-to-balanced transformer and hence to plural fin-lines arranged such that the fin-lines on one substrate surface are staggered relative those on the other surface; and

a plurality of microwave solid state amplifiers mounted on said dielectric substrate, each of which is connected to one of said microstrip lines;

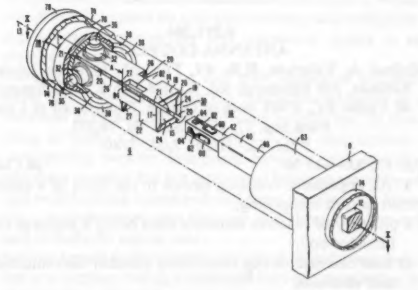
said array of fin-line transitions and attached solid state amplifiers being contained within a waveguide structure.

4,291,279

MICROWAVE COMBINER ASSEMBLY

Daniel C. Buck, Hanover, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1979, Ser. No. 95,173
Int. Cl.[3] H03F *3/60;* **H03B** *7/14*
U.S. Cl. 330—287 **9 Claims**



1. Microwave apparatus comprising:

a coaxial transmission line having a center conductor and an outer conductor, said conductors symmetrically disposed about the longitudinal axis of said line;

the center conductor having a hollow first section assembly and a second section assembly, each assembly symmetrically disposed about said longitudinal axis;

said first section assembly having a plurality of segments having edges parallel to said longitudinal axis and positioned to form an interior hollow space of predetermined dimension segments;

each segment having a first part and a second part of predetermined lengths whereby a slot formed between the longitudinal edges of respective segments in said first part is filled with a lossy dielectric means of predetermined impedance;

a plurality of diodes each suitable for providing negative resistance each having a first terminal in contact with respective segments in said first part at a predetermined position along said center conductor said diodes being in a radial configuration about said axis, and each diode having a second terminal coupled a heat sink means and to said outer conductor;

a compression means to secure said heat sink means, diodes, segments, and lossy dielectric means in fixed mechanical relationship to each other and to said axis;

said second section assembly inserted into said hollow space of the first section assembly and having a conductive means to couple a bias current to each segment and a microwave conductive means to couple microwave signals to said segments; and

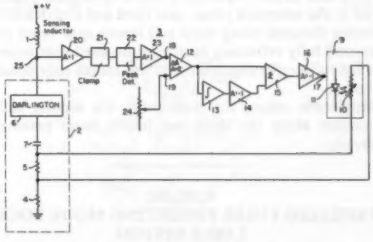
said outer conductor surrounding the combined first section and second section assemblies.

4,291,280

AC GENERATOR SYSTEM HAVING STABILIZED SENSITIVITY FOR SENSING THE PRESENCE OR ABSENCE OF A CONDUCTIVE OBJECT

George A. Gardner, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 15, 1978, Ser. No. 960,918
Int. Cl.[3] G01R *33/00;* **G01V** *3/11*
U.S. Cl. 331—65 **2 Claims**



1. A conductive object sensing system comprising, in combination, an oscillator for generating an alternating current and having inductance means responsive to a conductive object proximate thereto for causing said oscillator to stop generating said current;

regulator means connected to said oscillator for sensing said current and for producing a control signal in response thereto and in its value being in correspondence with both magnitude of deviation of said current from a predetermined level and duration of said deviation;

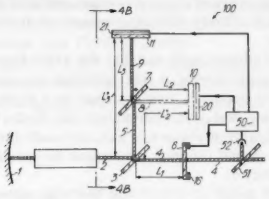
said predetermined level being that corresponding to there being no conductive object proximate to said sensor;

said oscillator having variable impedance through which said current flows, and which is connected to said regulator means for being varied by said control signal for changing the level of said current in accordance with the value of said control signal.

4,291,281
SINGLE MODE DOUBLE MICHELSON-TYPE LASER CAVITY RESONATOR

Michel Pinard, La Queue en Brie, France; Carl Aminoff, Helsinki, Finland; Gerard Trenec, and Franck Laloë, both of Paris, France, assignors to Agence National de Valorization de la Recherche, Neuilly sur Seine, France

Filed Sep. 5, 1978, Ser. No. 939,710
Claims priority, application France, Sep. 2, 1977, 77 26695
Int. Cl.³ H01S *3/082*
U.S. Cl. 331—94.5 C **3 Claims**



1. Cavity resonator arrangement for a single mode laser comprising:

means for producing and emitting a laser beam, said means including:

a cavity resonator;

a laser active material in said cavity resonator;

pumping means for activating said laser active material;

energy abstracting means; said cavity resonator comprising:

a first fully reflecting mirror on one side of said active material;

a first beam splitter means on the other side of said active material receiving said laser beam and splitting the same into first and second split beams directed along first and second split beam paths respectively perpendicular to each other said first and second beam paths and defining a reference plane;

a partially reflecting mirror in the first split beam path;

a second beam splitter means in the second split beam path, said second beam splitter means receiving said second split beam and splitting the same into a third split beam aligned with said second beam and a fourth split beam perpendicular to the reference plane, said third and fourth split beams being directed along third and fourth split beam paths;

a second fully reflecting mirror in the third split beam path;

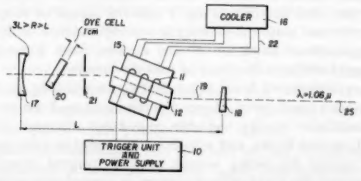
a third fully reflecting mirror in the fourth split beam path; and

piezoelectric means for positioning the second and third mirrors along the third and fourth beam paths respectively.

4,291,282
STABILIZED PULSE PRODUCING MODE LOCKED LASER SYSTEM

Robert R. Alfano, New York, and Bruce H. Green, Forest Hills, both of N.Y., assignors to The Research Foundation of the City University of New York, New York, N.Y.

Filed Sep. 7, 1979, Ser. No. 73,441
Int. Cl.³ H01S *3/13*
U.S. Cl. 331—94.5 S **18 Claims**

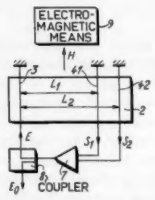


1. A stabilized pulse producing laser system with a mirror having a reflection surface and a specified radius condition, comprising in combination, a laser active material, input trigger pulsing means selectively inducing an envelope pulse of oscillations in said laser material, an optical path of length L passing through said laser material and terminating in two mirrors respectively located on opposite sides of the laser material, at least one said mirror having a radius of curvature R meeting the condition 3 L>R>L and at least one of said mirrors having a wedge shape so that the reflection surface is disposed at an angle on the order of less than 2°, a dye cell disposed in said path between the two mirrors to produce mode locking presenting a dye thickness in said path in the order of one centimeter, and means for passing laser output pulses through one of said mirrors, whereby the output pulses present similar intensity profiles in response to successive input trigger pulses without critical alignment tolerances.

4,291,283
SINGLE-MODE TUNABLE OSCILLATOR USING MAGNETOSTATIC WAVES

Jean P. Castera, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 27, 1979, Ser. No. 34,183
Claims priority, application France, May 3, 1978, 78 13090
Int. Cl.³ H03B *5/30*
U.S. Cl. 331—96 **6 Claims**



1. A single-mode tunable oscillator comprising:

amplifier means having an input and an output,

two magnetostatic wave delay lines providing different delays and interconnected in feedback loops from said output to said input, said lines being made in a magnetic material arranged in a layer formed between short-circuited input and output strip couplers deposited on said layer,

electromagnetic means simultaneously subjecting said two lines to an external magnetic field,

extracting means for extracting a fraction of the electric signal present at said output, the frequency f of said signal being varied by variation of the intensity of said magnetic field.

4,291,284
ANTENNA COUPLER

Michael A. Valeriote, R.R. #1, Puslinch, Ontario; Louis C. Kellman, 210 Edinburgh Rd. N., and Don E. Brandigampola, 40 Venier Dr., #903, both of Guelph, Ontario, all of Canada

Filed Sep. 17, 1979, Ser. No. 76,351
Int. Cl.³ H03H *7/38, 7/40*
U.S. Cl. 333—17 M **26 Claims**

1. An impedance coupling device in the form of a reactive circuit in turn comprising;

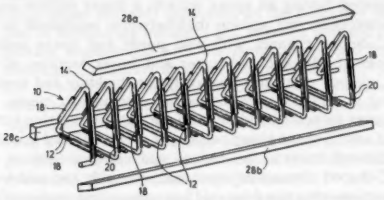
a plurality of reactive elements each being a segment of an inductor coil;

at least one electrically conductive member unconnected to said elements;

a plurality of movable contact elements operatively associated with respective ones of said reactive elements for electrically and selectively connecting and disconnecting

respective ones of said reactive elements and said at least one electrically conductive member, and,

a plurality of fluid operated cylinders each housing a movable piston having a piston rod effectively constituting a respective one of said movable contact elements, and



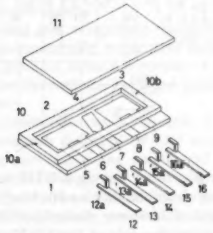
forming remotely operable actuating means and being unaffected by the presence of an electromagnetic field generated by said reactive circuit so to connect and disconnect respective ones of said reactive elements and said at least one electrically conductive member so in turn to vary the electrical characteristics of said reactive circuit.

4,291,285

SURFACE ACOUSTIC WAVE DEVICE AND METHOD OF MANUFACTURING

Michio Kadota, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 12, 1980, Ser. No. 120,784
Claims priority, application Japan, Feb. 22, 1979, 54-20455
Int. Cl.³ H03H *9/05, 9/09, 9/10, 9/145*
U.S. Cl. 333—150 **18 Claims**



1. A surface acoustic wave device, comprising:

a substrate having a main surface, transducer means located on said main surface and connected to withdrawing means which is also located on said main surface, said withdrawing means for connecting said transducer means to an external circuit;

a sheet member mounted on said main surface of said substrate and having an electrically conductive property in a direction perpendicular to said main surface and an insulating property a direction parallel to said main surface;

an interposing member interposed between said substrate and sheet member but not interposed between a portion of said withdrawing means and said sheet member, for forming a predetermined gap between said sheet member and said transducer means; and

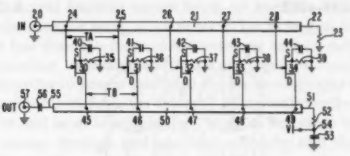
a lead-out terminal electrically connected to said sheet member at a location which causes said lead-out terminal to be electrically connected to said withdrawing means through said sheet member by virtue of said directionally conductive property of said sheet member.

4,291,286

HIGH BANDWIDTH TRANSVERSAL FILTER

Gary L. Wagner, Menlo Park, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 17, 1979, Ser. No. 104,624
Int. Cl.³ H03H *15/00;* **H01P** *1/201*
U.S. Cl. 333—166 **5 Claims**



1. A transversal filter having an input and an output comprising:

a delay line connected to said input;

a summer connected to said output; and

at least two field effect transistors each having an input connected to said delay line at a different point thereon and each having an output connected to said summer at a different point thereon;

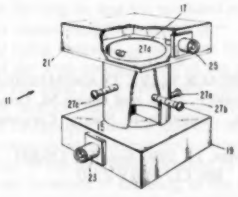
wherein the gain of each transistor is variable by changing said transistor's source current by means of adjusting a variable resistor that is connected between said source and ground.

4,291,287

EVANESCENT MODE FILTER

Frederick A. Young, and Edward L. Griffin, both of Huntington Beach, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 10, 1979, Ser. No. 101,592
Int. Cl.³ H01P *1/219, 1/208*
U.S. Cl. 333—210 **3 Claims**



1. An evanescent mode filter for ultra-high and microwave frequency bandpass filter applications, comprising:

a hollow waveguide member dimensioned below cutoff at an operating frequency, said waveguide member including a side wall and an input end and an opposite output end;

input/output coupling means associated with said input and output ends of said cylindrical waveguide member for respectively coupling RF energy into and out of said evanescent mode filter;

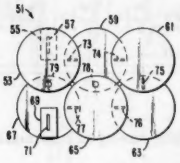
a plurality of evanescent resonators disposed in said waveguide member, alternate ones of said resonators forming internal bridge couplings; and

an evanescent resonator loading structure disposed in each of said evanescent resonators, at least one of said loading structures being oriented about the axis of said waveguide member at an angle with respect to at least one other of said loading structures.

4,291,288
FOLDED END-COUPLED GENERAL RESPONSE FILTER

Frederick A. Young; Edward L. Griffin, both of Huntington Beach, and Louis W. Hendrick, Hermosa Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 10, 1979, Ser. No. 102,290
Int. Cl.[3] H01P *1/208, 7/06*
U.S. Cl. 333—212 **4 Claims**



1. A folded end-coupled general response filter, comprising:

a filter structure having adjacent first and second cavity levels, each level including at least one TE_{011} cavity structure, each cavity structure in one of said levels overlapping at least one cavity structure in the other of said levels, the overlapping structure defining common end walls of said cavity structure;

mainline coupling means in said common end walls of each of said cavity structures for sequentially coupling all mainline electromagnetic energy between each of said cavity structures in one of said levels with an overlapping cavity structure in the other of said levels;

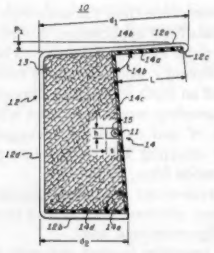
bridge coupling means in selected ones of said common end walls for coupling all bridge coupling energy and allowing implementation of all possible canonical couplings; and

input/output means mounted on said filter structure and including an input coupling fixture coupled to one of said cavity structures and an output coupling fixture coupling to another of said cavity structures for introducing an input signal to a first of said cavity structures and providing an output signal from a sequentially last of said cavity structures.

4,291,289
SHIELDED SURFACE WAVE TRANSMISSION LINE

Basrur R. Rao; Gerald F. Ross, and Harry M. Cronson, all of Lexington, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,951
Int. Cl.[3] H01P *1/30*
U.S. Cl. 333—240 **8 Claims**



1. A transmission line apparatus comprising:

a C-shaped channel having an open side and upper and lower sections of unequal length with an interconnecting section therebetween, said upper section of a length greater than said lower section;

propagation means for guiding signal waves;

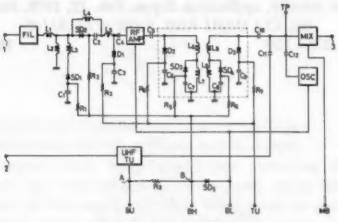
means, constructed of a first dielectric material, for supporting said propagation means adjacent said open side of said C-shaped channel; and

means, constructed of a second dielectric material, and Z-shaped having an upper section, a lower section and an interconnecting section therebetween, positioned in said C-shaped channel with said upper and lower sections thereof adjacent said upper and lower sections of said C-shaped channel respectively for shielding and containing said propagation means and said support means, said upper section extending from said interconnecting section of said Z-shape along said upper section of said C-shaped channel towards the end of said upper section of said C-shaped channel adjacent said open side and said lower section extending from said interconnecting section of said Z-shape, along said lower section of said C-shaped channel towards said interconnecting section of said C-shaped channel.

4,291,290
UHF-VHF TUNER HAVING DAMPING MEANS TO REDUCE INTERFERENCE IN UHF BAND

Sadayoshi Ijichi, Soma, and Eiji Nishizawa, Kakuda, both of Japan, assignors to Alps Electric Company, Ltd., Tokyo, Japan

Filed Aug. 3, 1979, Ser. No. 63,148
Claims priority, application Japan, Aug. 4, 1978, 53/95048
Int. Cl.[3] H03J *3/18;* **H04B** *1/10*
U.S. Cl. 334—1 **6 Claims**



1. In an electronic tuner having a VHF tuning portion including a resonant circuit having a switching diode for switching between a band of the lower channels of the VHF band and a band of the higher channels of the VHF band, and a UHF tuning portion, the improvement comprising damper means connected to said switching diode for supplying a voltage partially biasing said switching diode during operation of the UHF tuning portion whereby said switching diode will provide a resistance damping said resonant circuit.

4,291,291
CIRCUIT BREAKER PROVIDED WITH COLLAPSIBLE TELESCOPING LINKAGE

Donald K. Merchant, Cambridge, Md., assignor to North American Philips Controls Corp., Cambridge, Md.

Filed Sep. 18, 1979, Ser. No. 76,668
Int. Cl.[3] H01H *5/00*
U.S. Cl. 335—191 **17 Claims**

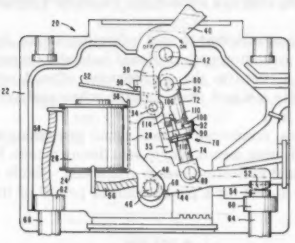
1. A circuit breaker comprising: an overcurrent sensor for sensing an electrical overload; a stationary contact; a movable contact electrically coupled to said overcurrent sensor and movable between open and closed positions out of and into contact with said stationary contact, respectively; collapsible coupling means coupled to said movable contact and adapted to be tripped by said overcurrent sensor, said movable contact being movable between its closed and open positions in re-

sponse to tripping of said collapsible coupling means; and actuator means movable in response to an overload condition detected by said overcurrent sensor for tripping said collapsible coupling means; wherein said collapsible coupling means comprises:

a pair of telescoping members relatively slideable one within the other;

locking means movably supported by the outer one of said pair of telescoping members and movable into and out of locking engagement with the inner one of said pair to telescoping members upon movement of said inner member to a predetermined extended position wherein said outer member, wherein, in the locking position, said locking means substantially prevents said telescoping members from moving relative to each other, and, in the unlocking position, said locking means permits relatively slideable movement of said telescoping members;

restraining means supported on said outer telescoping member and movable between a first position in which said



restraining means prevents movement of said locking means out of said locking position and a second position in which said restraining permits movement of said locking means out of said locking position toward and into said unlocking position; and

bias means biasing said restraining means toward said first position to automatically move said locking means into said locking position upon movement of said inner member to said predetermined extended position within said outer member;

wherein said actuator means is movable in response to an overload condition detected by said overcurrent sensor for engaging said restraining means and moving said restraining means toward and into said second position against the force of said bias means to thereby permit movement of said locking means into said unlocking position and thereby further permit collapsing of said coupling means and movement of said movable contact into its open position.

4,291,292

ELECTRIC COIL LEAD ATTACHMENT MEANS AND METHOD

William J. Witchger, 4241 Kessler Lane East Dr., Indianapolis, Ind. 46220

Filed May 21, 1979, Ser. No. 40,555
Int. Cl.[3] H01F *15/10*
U.S. Cl. 336—192 **9 Claims**

8. An electric coil assembly having a coil winding of a plurality of turns of coil wire between shoulders of a bobbin and having a layer of tape encircling the winding and retaining the coil wire in place between the bobbin shoulders;

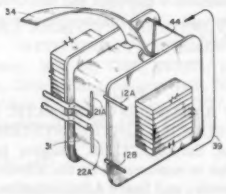
an elongate strip of resilient material having first latching means adjacent one end and second latching means longitudinally spaced from said first latching means and cooperable with said first latching means to secure said strip in a loop configuration;

a first electric lead fastened to said strip at a point and disposed entirely on one face of said strip, an insulated portion of said lead extending away from said strip, and a non-insulated portion of said lead extending parallel to the face of said strip from said point and immediately adjacent said face,

said one end of said strip being generally pointed, with said first latching means including at least one shoulder, the shoulder and pointed end establishing a pointed head on the strip,

said second latching means being an aperture in said strip, said aperture being of a size such that its largest dimension is less than the dimension transverse to said strip at said shoulder, whereby said head must be deformed at said shoulder to permit said head to pass through said aperture, pointed end first, the material being sufficiently resilient for said head to restore itself from its deformed state after passage through said aperture, whereby said shoulder is abuttingly engaged with said strip at said aperture to retain said head in latched state and maintain said strip in said loop configuration,

said lead being fastened to said strip at a point adjacent said head, said strip having a tail portion extending from said aperture in a direction away from said head and for a



distance greater than the distance from said head to said lead for insulating the non-insulated portion outboard of said face after connection to a coil lead and wrapping said tail portion over said non-insulated portion,

a second electric lead fastened to said strip,

each of said leads including an electrically insulated conductor and surrounding insulator, the leads being spaced in a plane containing said strip at the points of fastening said leads to the strip, and the fastening of the leads to the strip being by attachment of the insulator to the one outside face of the strip so that the insulated portions of the leads project transversely from the strip,

said strip being mounted on said tape layer with the inside face of the loop configuration of the strip encircling the tape layer snugly and resiliently, and the leads on the outside face of the strip, the lead conductors being attached to opposite ends of said coil wire to provide two lead connections, said lead connections being on the outside face of the strip and extending in opposite directions from the locations of fastening of the leads to the strip;

and the tail portion of the strip extending from the head in a second layer covering the said connections.

4,291,293

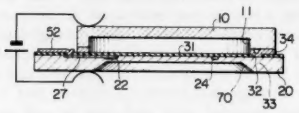
SEMICONDUCTOR ABSOLUTE PRESSURE TRANSDUCER ASSEMBLY AND METHOD

Kazuji Yamada; Seiko Suzuki; Motohisa Nishihara; Kanji Kawakami; Hideo Sato; Shigeyuki Kobori; Ryosaku Kanzawa; Minoru Takahashi, and Hitoshi Minorikawa, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1979, Ser. No. 76,813
Claims priority, application Japan, Sep. 27, 1978, 53/119016
Int. Cl.[3] G01L *1/22*
U.S. Cl. 338—4 **10 Claims**

1. A semiconductor pressure transducer assembly comprising: a silicon diaphragam assembly having a thin pressure sensitive diaphragm portion and a thick supporting portion surrounding the pressure sensitive diaphragm portion; piezoresistive elements constructed on the pressure sensitive dia-

phragm portion of said silicon diaphragm assembly, the resistance values of the piezoresistive elements varying depending on the strain appearing in the diaphragm portion in response to pressure applied thereto; conducting paths constructed on said silicon diaphragm assembly for electrically connecting of said piezoresistive elements; a passivating layer of insulating material covering a surface of said silicon diaphragm assembly on which said piezoresistive elements and said conducting paths



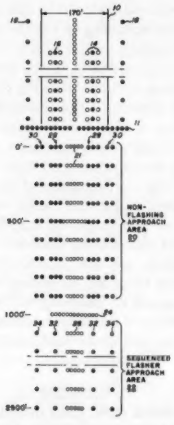
are constructed; a layer of conductive material formed on a surface of said passivating layer; and a covering member of insulating material mounted and bonded onto said silicon diaphragm assembly in contact with said conductive material layer on said passivating layer using Anodic Bonding method, wherein said piezoresistive elements and said conducting paths are constructed on said silicon diaphragm assembly using Ion Implantation method.

4,291,294

SPECTRALLY BALANCED CHROMATIC LANDING APPROACH LIGHTING SYSTEM

Wendell D. Chase, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 10, 1976, Ser. No. 749,420
Int. Cl.³ B64F *1/20*
U.S. Cl. 340—26 **7 Claims**



1. In an aircraft runway approach lighting system wherein said runway has a longitudinal centerline and said system includes a matrix of white lights delineating an approach area and straddling an axis coincident with said centerline, said matrix comprising rows of white lights transverse to said axis, each row having a left and a right end, the improvement comprising:

a first linear array of red/blue light combinations adjacent said left row ends; and

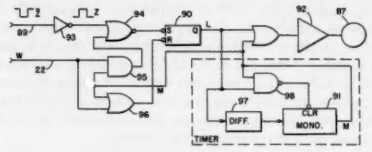
a second linear array of red/blue light combinations adjacent said right row ends, said arrays each being substantially parallel to said axis.

4,291,295

VEHICLE SPEED ENFORCEMENT SIGNAL

Robert D. Arnold, 1505 N. Quinn St., Apt. 17, Arlington, Va. 22209

Continuation-in-part of Ser. No. 955,297, Oct. 27, 1978, Pat. No. 4,250,487. This application May 6, 1980, Ser. No. 147,009
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—53 **6 Claims**



1. A vehicle speed monitoring device, comprising:

means, connected to the speedometer of said vehicle, for indicating that said vehicle has exceeded a predetermined speed;

timing means, attached to said indicating means, for extending the activation period of said indicating means;

means, connected to the speedometer of said vehicle, for generating a signal that is active when said vehicle is in motion; and

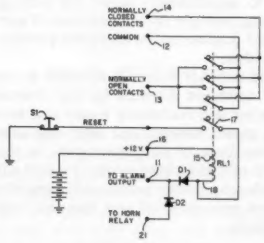
logic means, connected to said signal generating means, to said indicating means, and to said timing means, for deactivating said indicating means when said vehicle stops and remains at rest for a predetermined period of time.

4,291,296

ENGINE DISABLING

Monte G. Seifers, 2 Vantage Way, Nashville, Tenn. 37228

Filed Feb. 28, 1980, Ser. No. 125,621
Int. Cl.³ B60R *25/04, 25/10*
U.S. Cl. 340—64 **4 Claims**



1. Vehicle engine disabling apparatus comprising,

a first terminal for receiving an alarm output signal,

a second terminal for connection to a horn relay,

a common terminal,

relay means having a winding with first and second ends and latching and at least one other set of contacts,

a power terminal for receiving electrical potential from a source thereof connected between said power terminal and said common terminal,

said first end of said winding connected to said power terminal,

normally closed reset switching means for selectively interrupting current flow to said winding.

means including a first unilaterally conducting device for coupling said second end of said winding to said first terminal,

means including a second unilaterally conducting device for coupling said first terminal to said second terminal,

means including said latching contacts on said relay means and said reset switching means connecting said common

terminal to said second end of said winding for maintaining said relay means operated in response to the occurrence of an alarm signal on said first terminal until said reset switching means is open.

said first and second unilaterally conducting devices being oppositely poled so that said first unilaterally conducting device prevents said second terminal from receiving a horn relay operating potential and said second unilaterally conducting device prevents operation of said relay means upon the occurrence of a potential on said second terminal for operating a horn relay produced by manual actuation of a horn switch by a vehicle driver,

and at least first and second output terminals intercoupled by a first of said other set of contacts for connection to a vehicle engine electrical system for disabling the vehicle engine when said relay means is operated and allowing operation of the vehicle engine when said relay means is not operated.

4,291,297

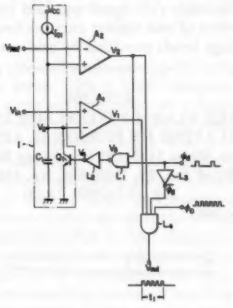
SINGLE RAMP COMPARISON ANALOG TO DIGITAL CONVERTER

Kenji Kanemaru, Musashino, and Takashiro Iwasaki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 809,007, Jun. 22, 1977, abandoned. This application Jan. 4, 1979, Ser. No. 927

Int. Cl.³ H03K *13/20*

U.S. Cl. 340—347 AD **8 Claims**



5. In an electronic circuit with a charging and discharging circuit comprising:

a charging and discharging circuit including a capacitor and a switching means coupled to said capacitor for enabling said capacitor to charge or discharge, said switching means having a control electrode for controlling the conductivity thereof; and

a control pulse signal supplied to said control electrode of the switching means for defining the period of charging or discharging action of said capacitor, said control signal having a predetermined voltage level generated during said period to cause said switching means to be conductive or non-conductive,

the improvements in said electronic circuit comprising:

a first voltage comparator means for comparing the terminal voltage appearing across said capacitor with a reference voltage and delivering an output signal;

a first logic means for applying said control pulse signal to said switching means, said first logic means receiving the output signal of said first voltage comparator means and said control pulse signal, and inhibiting said predetermined voltage level of said control signal from being supplied to said control electrode of the switching means at the time when the terminal voltage of said capacitor has a predetermined relationship to said reference voltage in the period of said control pulse signal, thereby to prevent unnecessary charging or discharging action defined in said period of said control pulse signal;

a second voltage comparator means for comparing the terminal voltage of said capacitor with an analog input voltage and delivering an output signal having a pulse width corresponding to the amplitude of said analog input voltage; and

a second logic means for receiving the output signals of said first and second voltage comparator means and a clock pulse signal, and passing said clock pulse signal within the period corresponding to said pulse width of the output signal of the second voltage comparator means and thereby obtaining a digital output signal which has the number of clock pulses corresponding to the value of said analog voltage, further comprising;

a third logic means for receiving the output signal of said first voltage comparator means and for stopping the supply of power to said charging and discharging circuit.

4,291,298

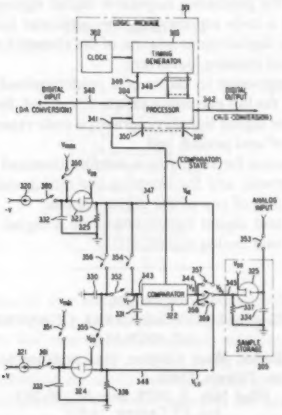
REVERSIBLE ANALOG TO DIGITAL CONVERTER WITH HIGH PRECISION

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 821,241, Aug. 2, 1977, abandoned. This application Aug. 20, 1979, Ser. No. 67,780

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **13 Claims**



1. A signal generator characterized by:

means for storing upper and lower limit voltages that are initially set to predetermined maximum and minimum levels respectively;

means for averaging the stored upper and lower limit voltages to form a trial voltage;

means for lowering the magnitude of the stored upper limit voltage to the level of the trial voltage in response to one state of a binary signal to form a new upper limit voltage;

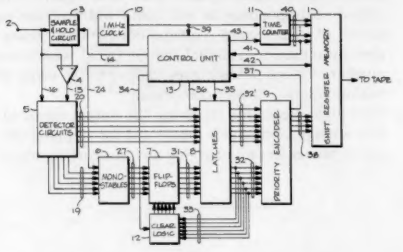
means for raising the magnitude of the stored lower limit voltage to the level of the trial voltage in response to an other state of the binary signal to form a new lower limit voltage; and

means for averaging the magnitude of the new upper limit voltage with the magnitude of the new lower limit voltage to form a new trial voltage.

4,291,299
ANALOG TO DIGITAL CONVERTER USING TIMED LEVEL CHANGES

Lorne C. Hinz, Richmond, and William P. Thomas, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 31, 1979, Ser. No. 89,937
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 AD **14 Claims**



1. An analog to digital converter comprising:

sampling means for sampling an analog signal in response to a sample command;

timing means for providing a digital representation of elapsed time following the last preceding sample command;

means, responsive to the analog signal, and responsive to the difference between the analog signal and the last preceding sample thereof, crossing respective predetermined levels, for producing respective digital signals each comprising a code representing the particular level crossing and the digital representation of the elapsed time at which this level crossing occurred;

means, responsive to elapse of a predetermined period following the last preceding sample command, for producing a further digital signal comprising a code representing the elapse of said period; and

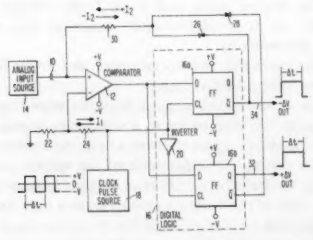
control means for supplying a sample command to the sampling means, and for resetting the timing means, on the production of any of the digital signals;

whereby said digital signals constitute a digital representation of said analog signal.

4,291,300
TRACKING ANALOG-TO-DIGITAL CONVERTER FOR AC SIGNALS

Clifford J. Bader, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1979, Ser. No. 90,253
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 AD **10 Claims**



1. An analog-to-digital converter system for converting input AC signals derived from at least a single source thereof to delta-format digital output pulses comprising:

capacitive means having a pair of terminals, one terminal of which is connected to a source of AC signals for storing a charge representative of the amplitude thereof,

comparison means coupled to the other terminal of said capacitive means, a reference potential and means for incrementally varying the latter potential by superimposing a component of voltage thereon, said comparison means comparing the potential corresponding to the charge on said capacitive means with said reference potential and providing periodic voltage transitions in response to the incremental variation of the reference potential when the potentials being compared are substantially equal and further providing voltage levels in the absence of said voltage transitions when said last mentioned potentials are unequal,

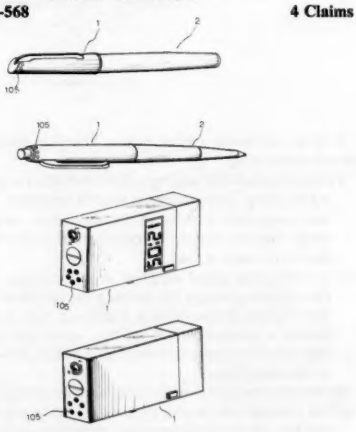
digital logic means coupled to said comparison means and being responsive to said voltage levels for generating said delta-format digital output pulses as indicative of a predetermined increment of change in the amplitude of said AC signals,

a feedback loop coupling said digital logic means to said other terminal of said capacitive means, said feedback loop being actuated by said digital logic means, concurrently with the generation of said delta-format digital output pulses, by causing selective bipolar currents to flow therein for a predetermined time, said bipolar currents restoring a balanced condition by charging said capacitive means to the difference in potential between a given amplitude AC signal and said reference potential, the direction of said bipolar currents being determined by said voltage levels provided by said comparison means.

4,291,301
REMINDER ALARM SYSTEM FOR PREVENTING MISLAYING OF PERSONAL ARTICLES

Han-Saw Chan, Room 1105, 185 Sung-Kang Rd., Taipei, Taiwan

Filed Jan. 28, 1980, Ser. No. 116,005
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—568 **4 Claims**



1. An electronic reminder for a usable personal article having a fixed general orientation during use thereof, said electronic reminder comprising a gravity activated position sensing switch, a battery, an electrically activated audio generator, and a compartment within said article for containing said position sensing switch, battery, and generator; which position sensing switch is for triggering the audio generator by a specified deviation of said article from said fixed general orientation; which usable personal article is a lighter; and said elec-

tronic reminder includes a switch attached to the lighter flintlock switch is triggered synchronously with the flintlock as the flintlock is cocked to light said lighter, and a shutting button; which flintlock switch is for switching the electronic reminder from an off-condition in which said position sensing switch cannot trigger said audio generator, to an on-condition in which said position sensing switch can trigger said audio generator, and which shutting button is for returning said electronic reminder from said on-condition to said off-condition.

4,291,302

LAMP MONITORING CIRCUITS

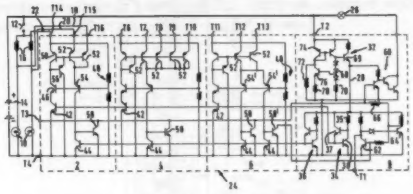
Gordon A. King, Buckingham; George R. Nimmo, Bexhill-on-Sea, and Wolfgang Bial, Borehamwood, all of England

Filed Nov. 7, 1979, Ser. No. 91,970

Claims priority, application United Kingdom, Nov. 13, 1978, 44221/78

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—642 **18 Claims**



1. A monitoring circuit for monitoring the voltage across a sensing resistor in series with a load, comprising a power supply line, means arranged to furnish two reference currents, which currents are each dependent both on temperature and on the voltage on the power supply line, a temperature-dependent voltage-stabilizing circuit for supplying the power supply line, said voltage-stabilizing circuit having a temperature co-efficient of such a sense and magnitude that the changes in a reference current due directly to changes in temperature are substantially offset by the changes in that reference current due to changes in the voltage on its power supply line, which changes are in turn due to the same changes in temperature; current-repeating means arranged to receive one of the said reference currents, and to provide an output current which is dependent both on the said one reference current, and on the potential difference across the series sensing resistor, the value of the output current at a predetermined value of the said potential difference being directly related to the value of the said one reference current; and comparing means connected for comparing the output current with the other reference current and to provide an output signal indicating whether the said potential difference is above or below the said predetermined value, in accordance with the result of the comparison.

4,291,303

TOUCH PAD AND DISPLAY TUBE CIRCUITRY

Scott E. Cutler, and Charles W. Eichelberger, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1979, Ser. No. 68,753

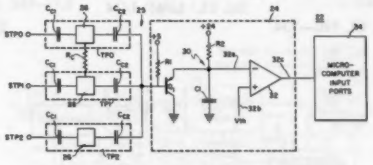
Int. Cl.³ G06F *3/14*; G09F *9/32*

U.S. Cl. 340—711 **52 Claims**

1. A touch pad circuit comprising:

first and second touch pads each having an input and an output, and having a common face plate which permits contaminants located on said face plate to form ohmic and/or dielectric couplings between said touch pads;

scan pulse generator means for applying touch pad scan pulses to said inputs of said touch pads to cause first and second touch response signals to appear at the outputs of said first and second touch pads, respectively; said touch pad scan pulses having a sufficiently fast rise-time that said first and second touch response signals initially pulse to an initial level determined by the capacitance to ground of said first and second touch pads, respectively, and thereafter change their value due to ohmic and/or capacitive coupling between said first and second touch pads caused



by contaminants on said common face plate if contaminants of a sufficient amount are located on said face plate; and

detector circuit means coupled to said touch pads for determining which, if any, of said touch pads is being touched by an operator of said touch pad circuit by examining said initial level of said touch pad response signals.

4,291,304

ELECTRO-OPTICAL DISPLAY DEVICE

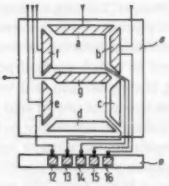
Karl-Heinz Walter, Grafing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,365

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743907

Int. Cl.³ G08B *5/36*

U.S. Cl. 340—715 **2 Claims**



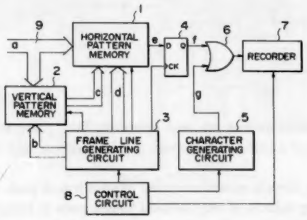
1. A process for operating an electro-optical display device, said device comprising a front and rear plate spaced apart to form a cavity for receiving a switchable medium, said front plate on a surface facing the medium being provided with at least one segmented electrode having segments and the rear plate on a surface facing the front plate and the medium being provided with a rear electrode assembly for each segmented electrode, said segments of the segmented electrode being individually energized along with the rear electrode assembly to switch the optical properties of the medium lying therebetween, an additional front control electrode electrically connected with each of the endangered electrode segments of the segmented electrode, said endangered electrode segments being segments whose malfunction leads to a representation of another possible character from the originally intended character being applied to the segmented electrode and a back control electrode disposed on the rear plate overlying the control electrode, said process comprising energizing the electrodes with a multiplex operation with two steps, said operation including during the first step of the two steps energizing the selected segments of the segmented electrode and its associated rear electrode assembly to display the selected information and during the last step energizing the back and front control electrodes.

4,291,305

METHOD FOR GENERATING FORMAT LINES AND CHARACTER DATA IN AN IMAGE SCANNING SYSTEM

Tsutomu Kimura; Hitoshi Miyoshi, and Sumio Mori, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 5, 1979, Ser. No. 72,773
Claims priority, application Japan, Sep. 5, 1978, 53-108959
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—734 **1 Claim**



1. In an image recording or displaying system using a light beam scanning means employing a raster scanning light beam modulated by a signal carrying character data, a method of generating format data to be combined with said character data so as to record or display format lines together with characters, comprising the steps of: preparing a horizontal pattern memory for memorizing a plurality of kinds of horizontal patterns in a direction parallel to scanning lines of the raster scanning means, preparing a vertical pattern memory for memorizing pattern codes which indicate the kind of said horizontal patterns with respect to vertical positions of the raster, causing said horizontal pattern memory to memorize all kinds of horizontal patterns of a format to be recorded or displayed together with the characters, causing said vertical pattern memory to memorize said pattern codes to memorize which kind of said all kinds of horizontal patterns of said format should be recorded or displayed at which vertical position of the raster, inputting a scanning line signal into said vertical pattern memory to cause the same to output one of said pattern codes in the form of a pattern select signal according to the vertical position of the raster, and inputting the pattern select signal into said horizontal pattern memory to cause the same to output one of said horizontal patterns in the form of a pattern signal according to the input pattern code.

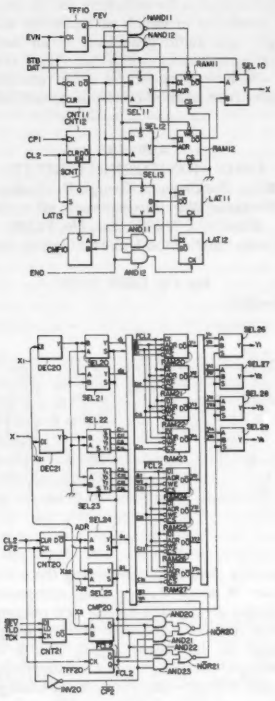
4,291,306

FIGURE DISPLAYING DEVICE

Kazuyuki Kodama, Kokubunji; Kunihiro Okada, Hinode; Takakazu Huno, Tachikawa; Takeyuki Endo, Hinode, and Yasutaka Shibuya, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 23, 1979, Ser. No. 96,682
Claims priority, application Japan, Dec. 4, 1978, 53-149104
Int. Cl.³ G06F *3/153*
U.S. Cl. 340—744 **4 Claims**

1. A figure displaying device for displaying a figure on the screen of a raster scan television in accordance with a plurality of dots, comprising: first memory means for storing dot information indicative of the ordinate and abscissa values of the respective dots on said screen; second memory means for storing preset information in a designated address by using the abscissa value of said dot information as an address; first control means for locating the dot information having the desired ordinate value from said first memory means so that the preset information may be stored in the address of said second memory means corresponding to the abscissa value of the dot information located; and second control means for sequentially reading out the information stored in said second memory means in accordance with the scanning operation of said



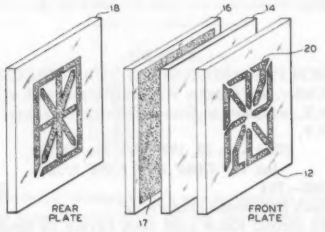
screen so that the figure may be displayed on said screen in accordance with the information read out.

4,291,307

PLANAR ALPHANUMERIC DISPLAY

Thomas B. Peelle, Farmington Hill, and Roland K. Kolter, Dearborn, both of Mich., assignors to International Telephone and Telegraph Corp., New York, N.Y.

Filed Mar. 19, 1979, Ser. No. 22,085
Int. Cl.³ G09F *9/32*
U.S. Cl. 340—756 **3 Claims**



1. A plural character alphanumeric display, in which said display is comprised of two panels in spaced superimposed relationship with an optical medium therebetween, and said characters comprise complementary arrays of conductive segments at plural character locations on both said panels in

aligned superimposed relationship adapted to be driven in a pattern by the application of a voltage to selected segments on both of said panels, the invention wherein each of said characters is comprised of a plurality of segments including a first group of segments forming the periphery of the character and a second group of segments radially disposed within the character, there being a like number of segments in each group, and wherein on a first of said panels the segments of the first group of each character are connected for driving connection to a voltage source, and the segments of the second group of each character are connected for driving connection to a voltage source, with the connection from both groups from each character being in multiple with the conductors from the like group of said other characters, and in which on the other panel, the segments of each character are paired with the segment of each pair being in alignment with separate groups within the character and each pairing is connected to a like pairing of the remaining characters for multiplexing of characters in a two step sequence by selective driving of selected pairings simultaneously with selective driving of the first and second groups of respective successive characters to illuminate selected alphanumeric characters at each of said locations.

4,291,308

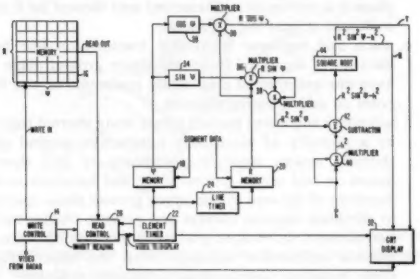
NON-LINEAR RASTER GENERATOR

Daniel J. Provine, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 1, 1979, Ser. No. 44,616

Int. Cl.³ G01S *13/89*

U.S. Cl. 343—5 SC **4 Claims**



1. A system for displaying data using a non-linear raster comprising

(1) memory means for storing video data to be displayed;

(2) first means for reading said stored video data to generate a video data signal;

(3) timer means for initiating said raster;

(4) first storage means for storing first non-linear scan parameters;

(5) second storage means for storing second non-linear scan parameters;

(6) second means for reading said first and second non-linear scan parameters from said first and said second storage means and for processing said first and second non-linear scan parameters, to generate non-linear x and y deflection signals; and

(7) display means responsive to said x and y deflection signals and said video data signal to display said video data signal using a non-linear raster.

4,291,309

FM/CW RADAR

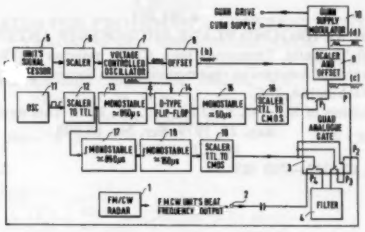
Basil H. R. Spiller, Byfleet, and Allan F. Pratt, Sutton, both of England, assignors to Decca Limited, London, England

Filed Aug. 23, 1979, Ser. No. 69,076

Claims priority, application United Kingdom, Aug. 25, 1978, 34621/78

Int. Cl.³ G01S *13/32*

U.S. Cl. 343—7.5 **7 Claims**



1. In a radar in which a signal in the form of a cyclically frequency modulated carrier wave is radiated and is also compared with an echo signal to derive a beat frequency signal, the improvement comprising:

means for interrupting detection of said beat frequency for intervals which are short relative to respective cycles of modulation of the carrier wave; and

means for impressing secondary modulation on said carrier wave during said intervals.

4,291,310

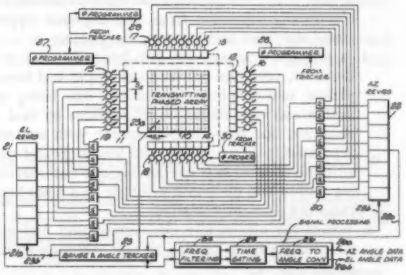
ADAPTIVE TWO-DIMENSIONAL NULL FORMING RECEIVING ANTENNA SYSTEM

Bradford E. Kruger, Woodland Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,798

Int. Cl.³ G01S *13/00*

U.S. Cl. 343—16 R **10 Claims**



1. A radar system capable of minimizing its receiving response to an interfering radiation source angularly separated from a target of interest, comprising:

first means for illuminating said target with radiant energy;

second means comprising at least one interferometer array having a pair of sub-arrays each with a plurality of elements mounted one on a first side of said first means and the other on the side opposite said first side, said sub-arrays being connected to provide an interferometer pattern having a main lobe and angularly spaced nulls in a first spatial angular coordinate on both sides of said main lobe;

array processing signal receiver means responsive to signals received through said second means as a result of illumina-

tion by said first means to provide target angle information;

third means responsive to said receiver means for developing a variable phase shift program for said sub-array elements to steer a null in said interferometer pattern within said first spatial angular coordinate so as to substantially eliminate received energy from said interfering radiation source, echo signals from said target being within said main lobe.

4,291,311

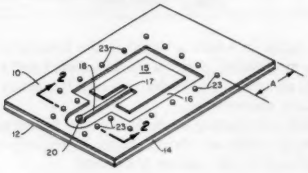
DUAL GROUND PLANE MICROSTRIP ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 837,058, Sep. 28, 1977. This application Aug. 23, 1979, Ser. No. 68,998

Int. Cl.³ H01Q *1/38*

U.S. Cl. 343—700 MS **33 Claims**



1. A dual ground plane strip-line fed electric microstrip antenna having low physical profile and conformal arraying capability, comprising:

a. a pair of thin conducting parallel ground planes;

b. a dielectric substrate separating and spacing apart said ground planes one from the other to provide an upper and a lower ground plane; said upper ground plane having a portion of predetermined dimensions of the area thereof removed;

c. a thin electrically conducting radiating element having a feedpoint thereon being formed coplanar with said upper ground plane within said removed area thereof, and being electrically separated from said coplanar upper ground plane and from said lower ground plane;

d. a stripline transmission line being located within said dielectric substrate between said upper and lower ground planes; said stripline transmission line being positioned within and surrounded on all surfaces by said dielectric substrate, and being non-copolanar with and electrically separated from said upper and lower ground planes; said stripline transmission line having one end thereof extending within said dielectric substrate to a point beneath said radiating element feedpoint;

e. means for electrically connecting said one end of the stripline transmission line to said radiating element feedpoint;

f. said upper and lower ground planes being shorted together by a plurality of electrically conductive shorting means; the strategic positioning of said shorting means on said upper ground plane and the location and dimensions of the area of said upper ground plane being operable to eliminate induced current and charge oscillation modes from occurring in said upper ground plane and prevent undesirable radiation from the upper ground plane including undesirable cross-polarization radiation;

g. said dual ground planes adjacent the area of said stripline transmission line operating to cause a reduction in transmission line leakage losses from said stripline transmission line without adversely affecting the operation of said radiating element, and said shorted upper ground plane operating to reduce coupling between closely spaced microstrip radiation elements.

4,291,312

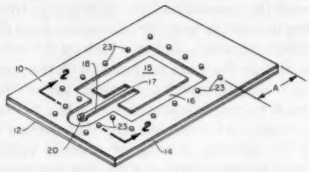
DUAL GROUND PLANE COPLANAR FED MICROSTRIP ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 837,058, Sep. 28, 1977. This application Aug. 23, 1979, Ser. No. 68,999

Int. Cl.³ H01Q *1/38*

U.S. Cl. 343—700 MS **32 Claims**



1. A dual ground plane coplanar-fed electric microstrip antenna having low physical profile and conformal arraying capability, comprising:

a. a pair of thin conducting parallel ground planes;

b. a dielectric substrate separating and spacing apart said ground planes one from the other to provide an upper and a lower ground plane; said upper ground plane having a portion of predetermined dimensions of the area thereof removed;

c. a thin electrically conducting microstrip radiating element having at least one feed point thereon being formed coplanar with said upper ground plane within said removed area thereof and being electrically separated from said coplanar upper ground plane and from said lower ground plane;

d. a microstrip transmission line for each said at least one feedpoint being located coplanar with said upper ground plane in a portion of said removed area thereof for feeding each said at least one feedpoint;

e. each said coplanar microstrip transmission line being electrically separated from said upper ground plane and have one end thereof electrically connected to one feedpoint on said radiating element;

f. said upper and lower ground planes being shorted together by a plurality of electrically conductive ground plane shorting means; strategic positioning of said shorting means on said upper ground plane and locations and dimensions of the area of said upper ground plane operating to eliminate induced current and prevent charge oscillation modes from occurring in said upper ground plane and prevent undesirable radiation from the upper ground plane including undesircross-polarization radiation;

g. said dual ground planes adjacent the area of said microstrip transmission line operating to cause a reduction in transmission line leakage losses from said microstrip transmission line without adversely affecting the operation of said microstrip radiating element.

4,291,313

RECORDING APPARATUS

Berthold Dold, Schramberg, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 140,747

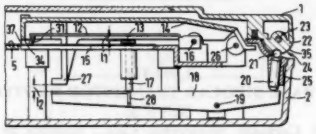
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917329

Int. Cl.³ G01D *9/00*

U.S. Cl. 346—68 **9 Claims**

1. Recording apparatus comprising a planar support for supporting a recording medium, means for driving the recording medium at a given rate, at least one recording instrument arranged to be movable relative to said support for providing

a recording on the recording medium when said recording instrument is moved into contact with the recording medium and the recording medium is driven, a lid for covering the recording medium wherein said lid is arranged for pivotal movement about a hinge axis which extends parallel to said planar support between open and closed positions relative to said support to move said recording instrument into contact with the recording medium when said lid is in said closed position and to raise said recording instrument out of contact



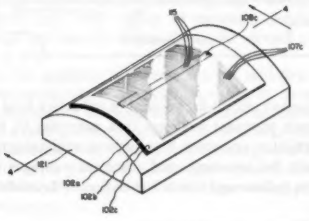
from the recording medium when said lid is in said open position, a guide part which is movable into contact with said recording instrument to raise said recording instrument out of contact from the recording medium when said lid is moved toward said open position, and drive means between said lid and said guide part for providing movement to said guide part when said lid is pivoted from said closed position toward said open position so that said recording instrument is held in a fixed position out of contact from the recording medium.

4,291,314

TRANSVERSE MAGNETIC PRINTING HEAD

Bernard D. Nathan, Lynchburg, Va., and Donald R. Witter, Ballston Lake, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 21, 1979, Ser. No. 40,586
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—74.5 **8 Claims**



1. A transverse magnetic printing head for impressing latent magnetic images on a magnetizable medium moving relative to said head, said head comprising:

a plurality of nonintersecting, conductive word lines disposed on a first, insulating substrate, said word lines crossing a first elongated gap in said first substrate, said word lines being insulated along those portions crossing said gap;

a plurality of nonintersecting, conductive digit lines disposed on a second, insulating substrate, said digit lines crossing a second elongated gap in said second substrate, said digit lines being insulated along those portions crossing said gap, said first and second elongated gaps being adjacently aligned and having substantially the same dimensions, each of said digit lines being substantially parallel to and opposite a word line where said lines cross said gaps;

a plurality of nonintersecting, sacrificial conductive lines disposed on a third, insulating substrate, said sacrificial lines crossing a third elongated gap in said third substrate, said second and third elongated gaps being adjacently aligned and having substantially the same dimensions, each of said sacrificial lines being substantially parallel to and opposite a digit line where said lines cross said gaps; and

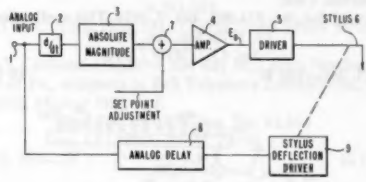
magnetically permeable material electrodeposited between adjacent word, digit, and sacrificial lines so as to form magnetic pole pieces along said elongated gap, so that adjacent magnetic pole pieces may be selectively energized by coincident current electrical signals present on said digit and word lines.

4,291,315

APPARATUS FOR PROVIDING A CONSTANT DENSITY TRACE OF ECG ANALOG SIGNALS

John V. Mizzi, Goldens Bridge, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,112
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 R **9 Claims**



1. Apparatus for providing a constant density trace of an analog signal the minimum rise and fall times of which are of the same order of magnitude as the thermal time constant of an associated thermal stylus comprising:

a record member having a thermally sensitive recording surface,

a thermal stylus having a given thermal time constant disposed adjacent said record member,

means connected to said thermal stylus for deflecting said stylus in response to said analog signal,

means connected to said thermal stylus for applying power to said thermal stylus which is a function of the magnitude of the rate of change of amplitude of said analog signal, and

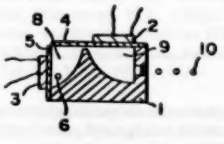
means for introducing a delay of at most said given thermal time constant connected to said means for deflecting said stylus.

4,291,316

SYSTEM FOR DRIVING INK DROP GENERATOR OF INK-JET PRINTER

Sadao Kakeno, Yokohama; Taisen Hayashi, Tokyo; Hiromichi Komai, Kawasaki, and Hiroshi Yamazaki, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1979, Ser. No. 50,458
Claims priority, application Japan, Jun. 27, 1978, 53-77785
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **3 Claims**



1. A system for driving an ink drop generator comprising:

(A) a first ink drop issuing chamber provided with a first

diaphragm and communicating with an ink drop issuing nozzle,

(B) a second pressure biasing chamber provided with a second diaphragm for exerting a bias pressure to the ink in said second chamber and communicating with said first ink chamber and an ink source,

(C) means for driving said second diaphragm at a predetermined frequency, and

(D) means for driving said first diaphragm at a frequency twice as high as the frequency of said second diaphragm in synchronism with the driving of said second diaphragm during the positive going half cycle of the driving voltage applied to said second diaphragm to thereby issue ink drops through said nozzle.

4,291,317

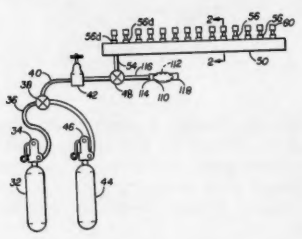
INKING SYSTEM FOR MULTI-PEN RECORDERS

William C. Corwin, La Grange, and Raymond M. Pawlak, Addison, both of Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 914,089, Jun. 9, 1978. This application Nov. 13, 1979, Ser. No. 93,721

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **10 Claims**



1. In a multi-pen recorder, a plurality of recording pens, means including a plurality of separate ink reservoirs one for each pen for normally supplying ink to said pens on a gravity-fed capillary basis, a gas manifold common to said recording pens, means for supplying gas under pressure to said manifold, and valve means for individually connecting said ink reservoirs to said manifold, thereby selectively to prime any one of said recording pens.

4,291,318

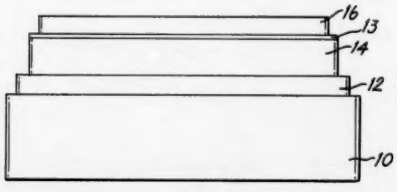
AMORPHOUS SILICON MIS DEVICE

Joseph L. Sansregret, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 3, 1979, Ser. No. 99,420

Int. Cl.³ H01L *45/00*

U.S. Cl. 357—2 **1 Claim**



1. An amorphous silicon semiconductor device having increased open circuit voltage and photovoltaic longevity, said device comprising:

a substrate;

a layer of amorphous silicon containing hydrogen deposited on said substrate and having a region of SiOx where x is defined by the relationship $1 \leqq x \leqq 2$, said SiOx layer formed by first etching a surface region of the amorphous silicon to provide a normal surface than oxidizing said normal surface with a sulfur based oxidant;

a metallic layer, contiguous to said oxide and forming a junction to said amorphous silicon, SiOx or the combination thereof.

4,291,319

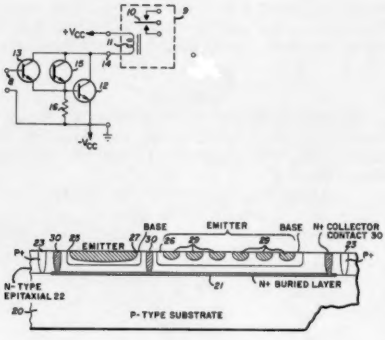
OPEN BASE BIPOLAR TRANSISTOR PROTECTIVE DEVICE

Charles P. Carinalli, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 687,722, May 19, 1976, abandoned. This application Jun. 27, 1979, Ser. No. 52,531

Int. Cl.³ H01L *29/90*

U.S. Cl. 357—13 **5 Claims**



1. An integrated circuit for switching inductive load devices which generate transient voltages that may rise to levels in excess of transistor collector breakdown, said integrated including means for arresting said transient voltages to limit them to levels below said transistor collector breakdown and comprising:

a semiconductor substrate;

at least one isolated region in said substrate;

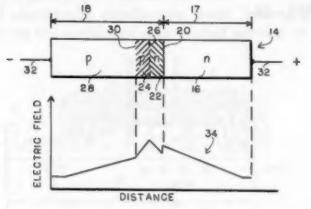
an output transistor located in said isolated region, said output transistor having a base, a collector and an emitter made up of a plurality of individual small area emitter sections, the combination of which provides the total collector current capability, and

a protective active transistor located in said substrate, said protective transistor having a floating, unconnected base, a collector coupled in common with said collector of said output transistor, and an emitter coupled to said base of said output transistor whereby said collector of said protective transistor in reverse biased when acting as a protective device, said emitter of said protective transistor being composed solely of a single emitter section having an area that is large in relation to the area of an individual one of said small area emitter sections to create a base region in said protective transistor that is thinner than the base region in said output transistor, said protective transistor having an active and higher base to collector current gain and a collector breakdown voltage that is close to but lower than the collector breakdown voltage of said output transistor.

4,291,320
HETEROJUNCTION IMPATT DIODE

Cheng P. Wen, Mission Viejo, Calif.; Reidar L. Kuvas, Eiksmarka, Norway, and Anthony A. Immorlica, Jr., Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 10, 1980, Ser. No. 110,965
Int. Cl.[3] H01L *29/90, 29/161*
U.S. Cl. 357—13 7 Claims

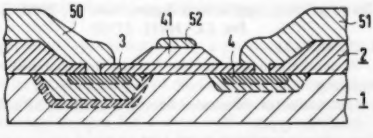


1. A double drift IMPATT diode comprising:
a first semiconductor of a first conductivity type having a first bandgap, said first semiconductor comprising a drift region of said first conductivity type;
a second semiconductor of a conductivity type opposite said first conductivity type joined to said first semiconductor by a heterojunction, said second semiconductor having a second bandgap, said second bandgap being lower than said first bandgap;
a first avalanche region of said first conductivity type in said second semiconductor adjacent said heterojunction;
a second avalanche region of said opposite conductivity in said second semiconductor abutting said first avalanche region to form a p-n junction;
a drift region of said opposite conductivity type in said second semiconductor abutting said second avalanche region, said drift region of opposite conductivity type being less heavily doped than said second avalanche region; and
means for applying a reverse bias to said first and second semiconductors of sufficient voltage to cause avalanche multiplication of electrons and holes in said first and second avalanche regions, and drift of charge carriers of said first conductivity type in said drift region of first conductivity type, and drift of charge carriers of said opposite conductivity type in said drift region of opposite conductivity type.

4,291,321
MIS-FIELD EFFECT TRANSISTOR HAVING A SHORT CHANNEL LENGTH AND METHOD OF MAKING THE SAME

Hans-Jörg Pfleiderer, Zorneding, and Dietrich Widmann, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 245
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802838
Int. Cl.[3] H01L *29/78*
U.S. Cl. 357—23 16 Claims

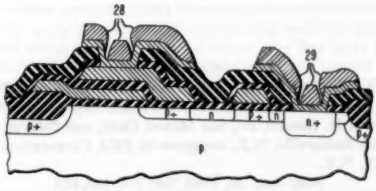


1. An MIS field effect transistor having a short channel length, comprising a semiconductor substrate, on the surface of which there is arranged an insulating layer, which is in turn, provided with a gate electrode, a drain zone and a source zone, of the first conductivity type, provided in the semiconductor substrate, which zones meet the substrate surface, an additional doped zone of the second conductivity type laying below said source zone and surrounding the latter, at least in the direction of said drain zone, and which meets the substrate surface, spaced laterally with respect to said source zone below said gate electrode layer, a second less heavily doped zone of the first conductivity type extending between the source zone and said additional zone of opposite conductivity type, a less heavily doped zone of the first conductivity type surrounding said drain zone, at least in the direction of said source zone, said zone of the second conductivity type and the less heavily doped zones of the first conductivity type containing implanted dopant particles.

4,291,322
STRUCTURE FOR SHALLOW JUNCTION MOS CIRCUITS

James T. Clemens, Allentown, and Kay M. Locke, Northampton, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 30, 1979, Ser. No. 61,664
Int. Cl.[3] H01L *29/78, 29/04, 23/48*
U.S. Cl. 357—23 10 Claims



1. An MOS integrated circuit including source and drain regions (**20** and **21**) of one conductivity type formed in one major surface of a semiconductor body (**10**) of opposite conductivity type so as to form p-n junctions therein and a structure for making electrical contact to portions of the circuit comprising an insulating layer (**23**) formed over the circuit and including windows (**24** and **25**) formed therein exposing the portions to be contacted, a layer (**26**) of polycrystalline silicon selectively formed over said insulating layer so as to form a continuous coating over the side walls of said windows, and a layer of metal (**28** and **29**) formed over said polycrystalline silicon layer CHARACTERIZED IN THAT the junction depths of the source and drain regions are 0.40 μm or less, the side walls of the windows are steep with sharp edges, the layer of metal is essentially discontinuous at the side walls, and the polycrystalline silicon layer provides a low resistance to current conduction in the areas of the side walls.

4,291,323
INDIUM PHOSPHIDE ARSENIDE BASED DEVICES

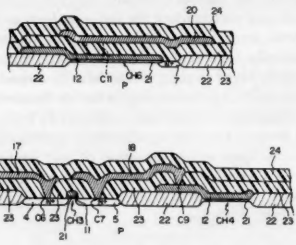
Klaus J. Bachmann, Piscataway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1980, Ser. No. 145,610
Int. Cl.[3] H01L *31/00, 31/06*
U.S. Cl. 357—30 4 Claims

1. A device comprising a region of a first semiconductor material comprising $InAs_{1-x}P_x$ in intimate contact with a region of a second material and means for applying a voltage to said first semiconductor material CHARACTERIZED IN THAT said first semiconductor material is $InAs_{1-x}P_x$ where $0.85 \leqq x < 1$ and wherein said second material comprises a

composition chosen from the group consisting of indium tin oxide and indium oxide whereby a rectifying junction is formed.

3. A device comprising a region of a first semiconductor



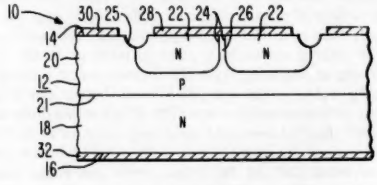
material comprising $InAs_{1-x}P_x$ in intimate contact with a region of a second material and means for applying a voltage to said first semiconductor material CHARACTERIZED IN THAT said first semiconductor material is $InAs_{1-x}P_x$ where $0.85 \leqq x < 1$ and wherein said second material is $In_yGa_{1-y}As$.

4,291,324

SEMICONDUCTOR POWER DEVICE HAVING SECOND BREAKDOWN PROTECTION

Sebastian W. Kessler, Jr., San Mateo, Calif., and John A. Olmstead, Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,453
Int. Cl.[3] H01L *29/72*
U.S. Cl. 357—36 **10 Claims**



1. A semiconductor power device, comprising:

a semiconductor pellet having first and second opposing major surfaces and incuding, in series, emitter, base and collector regions of alternate conductivity type;

the collector region being substantially planar and adjacent to the second surface;

the base region adjacent to the collector region and extending to the first surface;

the emitter region extending relatively deeply into the pellet from the first surface and being substantially surrounded by the base region; the emitter region substantially surrounding a substantially centrally located extension of the base region, said extension being of relatively high resistance and extending to the first surface;

an emitter electrode contacting the emitter region and said base region extension;

a collector electrode contacting the collector region; and

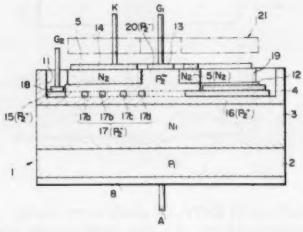
a base electrode contacting the base region.

4,291,325

DUAL GATE CONTROLLED THYRISTOR WITH HIGHLY DOPED CATHODE BASE GRID COVERED WITH HIGH RESISTIVITY BASE LAYER

Tetsuro Sueoka, Numazu, and Satoshi Ishibashi, Higashimine, both of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Jan. 4, 1980, Ser. No. 109,677
Claims priority, application Japan, Jan. 29, 1979, 54-9566
Int. Cl.[3] H01L *29/74*
U.S. Cl. 357—38 **6 Claims**



1. A gate controlled semiconductor device comprising:

a semiconductor wafer made of: a first layer of one conductivity type; a second layer of an opposite conductivity type, connected to the first layer; a third layer of said one conductivity type connected to said second layer; said first and third layers having exposed surfaces; a high resistance layer of said one conductivity type formed on said third layer at said surface thereof to a selected depth; and a fourth layer of said second conductivity type connected into said high resistance layer having a surface;

an anode electrode connected to said first layer exposed surface;

a cathode electrode connected to said fourth layer surface;

a first gate electrode layer connected to an exposed surface of said high resistance layer;

said third layer having a first slot in the exposed surface thereof;

a first low resistance layer at the bottom of said first slot;

said third layer having a plurality of second slots extending into said fourth layer and communicating with said first slot;

a second low resistance layer at the bottom of each of said plurality of second slots connected to said first low resistance layer;

a second gate electrode layer for supplying an OFF signal to the device connected over a surface of said first and second low resistance layers; and

at least one buried low resistance layer which is narrower than said first and second low resistance layers; embedded in said third layer and spaced from said second and fourth layers, connected to each of said second low resistance layers.

4,291,326

SEMICONDUCTOR DEVICE

Mitsuo Higuchi, Tokyo, and Kiyoshi Miyasaka, Yokohama, both of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 20, 1979, Ser. No. 96,217
Claims priority, application Japan, Nov. 27, 1978, 53-146248
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—51 **15 Claims**

1. A semiconductor device for use in bootstrap circuits, comprising:

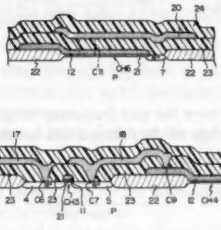
a semiconductor substrate, having a surface, of a first conductivity type;

first, second and third regions of a second conductivity type formed in said semiconductor substrate;

a first insulating layer having a first portion with a surface formed on the surface of said semiconductor substrate between said first and second regions, said first insulating layer further having a second portion with a surface formed on the surface of said semiconductor substrate adjacent to said third region;

a first electrically conductive layer formed on the surface of said first portion of said first insulating layer, said first electrically conductive layer, said first portion of said first insulating layer and said first and second regions forming an MIS transistor;

a second electrically conductive layer, having a surface, formed on the surface of said second portion of said first



insulating layer, wherein a capacitor is formed by said surface of said second electrically conductive layer and by the surface of said substrate adjacent to said third region, said surface of said second electrically conductive layer and said surface of said substrate separated by said second portion of said first insulating layer, said second electrically conductive layer electrically connected to said second region; and

a substantially radiation opaque layer, having a first contact formed on said second region and having a second contact formed on said second electrically conductive layer, for preventing radiation from penetrating into said second region, said substantially radiation opaque layer overlying the whole of said second region.

4,291,327

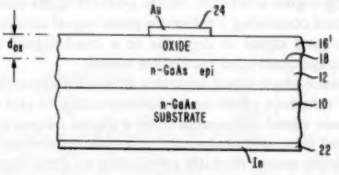
MOS DEVICES

Won-Tien Tsang, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 937,318, Aug. 28, 1978. This application Jan. 23, 1980, Ser. No. 114,683

Int. Cl.³ H01L *29/34*

U.S. Cl. 357—52 **4 Claims**



1. An MIS capacitor comprising:

a GaAs single crystal semiconductor body,

an insulating layer formed on a major surface of said body, and

a metal electrode formed on said insulating layer, characterized in that:

said insulating layer is formed by a process comprising the steps of:

epitaxially growing a layer of $Al_xGa_{1-x}As$ on said body and thermally treating said $Al_xGa_{1-x}As$ in an atmosphere containing oxygen for a time sufficient to convert said $Al_xGa_{1-x}As$ layer to said insulating layer, said conversion being essentially self-terminating at said major surface.

4,291,328

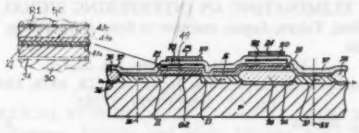
INTERLEVEL INSULATOR FOR INTEGRATED CIRCUIT WITH IMPLANTED RESISTOR ELEMENT IN SECOND-LEVEL POLYCRYSTALLINE SILICON

Jih-Chang Lien, Sugarland, and Te-Long Chiu, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 15, 1979, Ser. No. 48,961

Int. Cl.³ H01L *29/04, 27/02, 29/78*

U.S. Cl. 357—59 **4 Claims**



1. In a semiconductor integrated circuit,

(a) a first level of polycrystalline silicon overlying a face of a semiconductor body and patterned to define electrodes of circuit elements and interconnections between electrodes,

(b) a second level of polycrystalline silicon overlying said face and at least partially overlying said first level of polycrystalline silicon, said second level being patterned to define parts of circuit elements and interconnections,

(c) and a triple layer insulator separating said first and second levels of polycrystalline silicon, the first layer being thermal silicon oxide on the first level, the second layer being doped low-temperature deposited silicon oxide and the third layer being undoped low-temperature deposited silicon oxide.

4,291,329

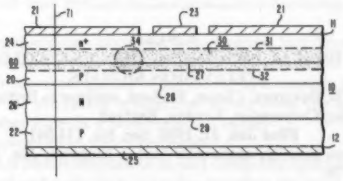
THYRISTOR WITH CONTINUOUS RECOMBINATION CENTER SHUNT ACROSS PLANAR EMITTER-BASE JUNCTION

Maurice H. Hanes, Murrysville, and Earl S. Schlegel, Plum, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1979, Ser. No. 71,631

Int. Cl.³ H01L *29/167*

U.S. Cl. 357—64 **4 Claims**



1. A semiconductor thyristor comprising:

(a) top and bottom surfaces;

(b) a first layer of semiconductor material adjacent to said top surface;

(c) a second layer of semiconductor material adjacent to said first layer of semiconductor material and forming a first metallurgical p-n junction therewith;

(d) a third layer of semiconductor material adjacent to said second layer of semiconductor material and forming a second metallurgical p-n junction therewith;

(e) a fourth layer of semiconductor material adjacent to said

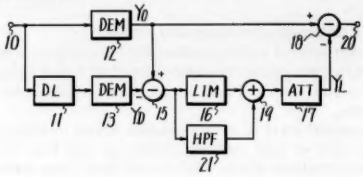
third layer of semiconductor material and adjacent to said bottom surface and forming a third metallurgical p-n junction with said third layer of semiconductor material; and

(f) a recombination region extending only about said first metallurgical p-n junction and spaced apart from said top surface and from said second metallurgical p-n junction, said recombination region having a predetermined concentration of lattice dislocation therein for eliminating current carriers therein.

4,291,330
VIDEO SIGNAL PROCESSING CIRCUIT FOR ELIMINATING AN INTERFERING SIGNAL

Jun Hirai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1979, Ser. No. 32,926
Claims priority, application Japan, Apr. 28, 1978, 53-51819
Int. Cl.³ H04N 5/21, 5/785
U.S. Cl. 358—8 **8 Claims**



2. A video signal processing circuit for eliminating an interfering signal included in a video signal, said circuit comprising:

delaying means for delaying said video signal for a predetermined number of horizontal line intervals to produce a delayed video signal;

first combining means for combining said video signal with said delayed video signal, said first combining means producing a first difference signal representing the difference between said video signal and said delayed video signal;

means for limiting amplitude excursions of said first difference signal to produce a limited difference signal; and

second combining means for combining said video signal with said limited difference signal to produce an output signal representing the difference between said video signal and said limited difference signal, whereby said second combining means produces said output signal free of said interfering signal.

4,291,331
DIGITAL PROCESSING OF N.T.S.C. COLOR TELEVISION SIGNALS

Victor G. Devereux, Cheam, England, assignor to British Broadcasting Corporation, London, England

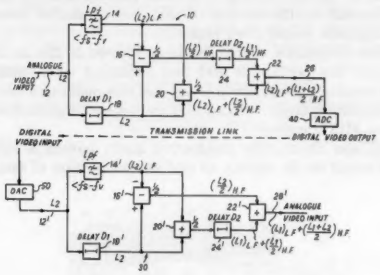
Filed Jan. 21, 1980, Ser. No. 114,041
Claims priority, application United Kingdom, Jan. 26, 1979, 02912/79
Int. Cl.³ H04N 9/02
U.S. Cl. 358—13 **35 Claims**

1. A method of processing an N.T.S.C. colour television signal, comprising:

at a transmitter, digitising an input signal with a sampling frequency f_s which has a mean value equal to $m.f_L \pm (p+\frac{1}{2})f_F$, where m and p are integers, f_L is the line scan frequency and f_F is the field scan frequency; and

at a receiver, comb filtering the received signal at least over the frequency range $(f_s - f_v)$ to f_v, where f_v is the frequency of the highest substantial frequency component of the original N.T.S.C. signal;

wherein said filtering comprises the steps of: delaying the signal by an integral number of line periods equal to one field period minus half a line period; and

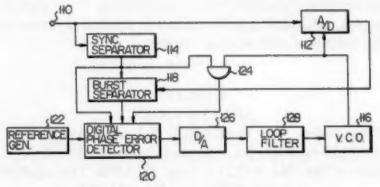


providing over the said frequency range a signal equal to the average of the delayed and undelayed signals.

4,291,332
PHASE-LOCKED CIRCUIT

Masaaki Kato, Kawasaki, and Keisuke Ogi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 10, 1980, Ser. No. 138,896
Int. Cl.³ H04N 9/46; H04L 7/08
U.S. Cl. 358—19 **30 Claims**



1. A phase-locked circuit comprising:

voltage controlled oscillation means;

analog-digital converter means converting an analog input signal containing a reference phase signal component into a digital signal in response to a clock signal from said voltage controlled oscillation means;

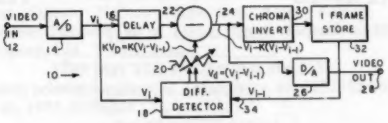
reference phase signal separator means for extracting a digital reference phase signal corresponding to said reference phase signal component from a digital output signal supplied from said analog-digital converter means; and

operation means digitally calculating an error signal corresponding to the difference between a predetermined reference phase difference and a phase difference between said analog reference phase signal component and said clock signal on the basis of the digital reference phase signal from said reference phase signal separator means, and supplying said voltage controlled oscillation means with an analog output signal corresponding to said error signal as a control signal, thereby causing the phase difference between the output signal from said voltage controlled oscillation means and said analog reference phase signal component to be made equal to said predetermined reference phase difference.

4,291,333
NOISE FILTER

Richard B. Warnock, Bountiful, and John A. Briggs, Midvale, both of Utah, assignors to Fernseh Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 41,455, May 22, 1979, abandoned. This application May 9, 1980, Ser. No. 148,437
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—36 **14 Claims**



1. A recursive filter for reducing noise in an incoming digitized, multi-bit television type signal having at least luminance components, comprising:

subtracting means having first and second inputs and an output;

means for applying the incoming television signal to the first input of said subtracting means without substantially attenuating the incoming signal;

delay means coupled to the output of said subtracting means for developing a signal delayed by an interval substantially equal to a selected multiple of a television field interval;

a motion detector receiving the incoming television signal and the delayed signal from said delay means for developing a difference signal representative of the differences between the incoming television signal and the delayed signal;

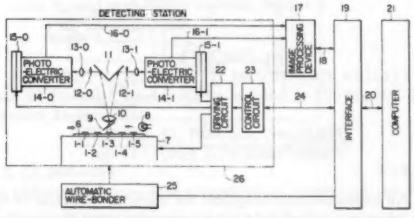
an attenuator receiving the difference signal for selectively attenuating the same as a function of the amplitude of the difference signal; and

means for coupling the attenuated difference signal to the second input of said subtracting means.

4,291,334
SYSTEM FOR DETECTING THE POSITION OF AN OBJECT

Michihiro Mese; Seiji Kashioka, both of Hachioji; Masakazu Ejiri, Tokorozawa; Takafumi Miyatake, Hachioji; Isamu Yamazaki, Tachikawa, and Toshimitsu Hamada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,848
Claims priority, application Japan, May 19, 1976, 51-56519
Int. Cl.³ H04M *7/00*; G01B *11/00*
U.S. Cl. 358—101 **25 Claims**



1. A system for detecting the position of an object comprising:

first means for photo-electrically converting at least one portion image in said object;

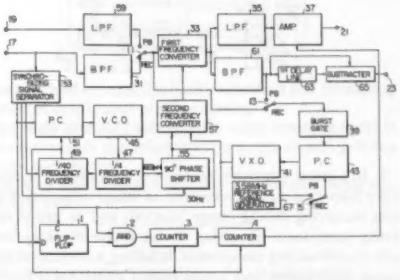
second means connected to said first means and adapted to detect an approximate position of a specific pattern of said portion image photo-electrically converted by said first means by determining the coincidence of said specific pattern with a standard mask pattern; and

third means connected to said first and second means for examining the area of the specific brightness of each of the images of a plurality of regions within said portion image corresponding to said approximate position of the specific pattern detected by said second means to detect the exact position of said specific pattern.

4,291,335
VERTICAL SYNCHRONIZING SIGNAL DETECTOR

Isao Nakagawa, Katsuta, and Norio Minami, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1979, Ser. No. 98,632
Claims priority, application Japan, Dec. 1, 1978, 53-147888
Int. Cl.³ H04N *5/10*
U.S. Cl. 358—154 **5 Claims**



4. In a vertical synchronizing signal detector comprising:

(a) a synchronizing signal source for outputting a composite synchronizing signal including a horizontal synchronizing signal and a vertical synchronizing signal, each synchronizing signal having a reference level;

(b) a pulse source for generating a clock pulse of a frequency higher than that of the horizontal synchronizing signal; and

(c) counting means having an input terminal for counting the number of pulses supplied to said input terminal during each recurrent period of horizontal synchronizing signal and for producing a detection signal when the counted number exceeds a predetermined value;

the improvement which comprises:

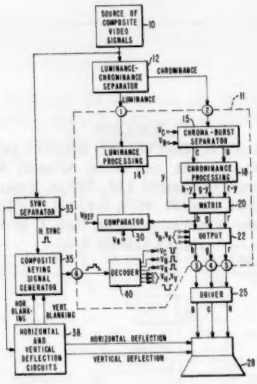
(d) latch means supplied with said composite synchronizing signal and said clock pulse for sampling the level of said composite synchronizing signal at a predetermined incidence of each said clock pulse and holding the thus-sampled level till the next sampling at the predetermined incidence of a succeeding clock pulse, so that a latched signal whose presence substantially corresponds to the presence of the synchronizing signals at the reference level is obtained;

(e) gate means connected between said pulse source and said input terminal of said counting means for allowing said clock pulse to pass therethrough during the presence of said latched signal output from said latch means and for preventing said clock pulse from passing therethrough during the absence of said latched signal.

4,291,336
COMPOSITE KEYING SIGNAL GENERATOR FOR A TELEVISION RECEIVER

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 18, 1980, Ser. No. 113,214
Int. Cl.[3] H84N 5/44
U.S. Cl. 358—160 9 Claims



1. In a color television receiver for processing a composite color television signal containing an image information component occurring during image intervals and an image synchronizing component occurring during image blanking intervals, said synchronizing component including a horizontal synchronizing component and a succeeding color burst component occurring during horizontal image blanking intervals; said receiver including means for providing a periodic horizontal reference pulse representative of said horizontal synchronizing component; means for deriving horizontal and vertical blanking signals from said synchronizing component; keyed signal processing circuits; and apparatus for generating a composite keying signal comprising a first pulse of desired magnitude substantially coincident with said blanking interval and a second pulse superimposed on said first pulse and encompassing the burst component interval, said apparatus comprising:

keyed means responsive to said horizontal reference pulse for producing a gate pulse encompassing said burst interval;

means for coupling said derived horizontal and vertical blanking signals to a common point;

means, operative in common with respect to said derived horizontal and vertical blanking signals, coupled to said common point for clipping amplitude excursions of said derived horizontal and vertical blanking signals to a given level;

means, operative in common with respect to said clipped horizontal and vertical blanking signals, for translating said clipped horizontal and vertical blanking signals to produce horizontal and vertical blanking signals of a desired magnitude;

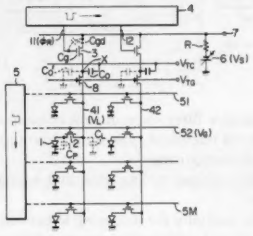
means for combining said burst gate pulse and said translated horizontal and vertical blanking signals to produce said composite keying signal; and

means for coupling said composite keying signal to said keyed signal processing circuits.

4,291,337
ELECTRIC CHARGE TRANSFER APPARATUS

Tooru Takamura, Takatsuki; Sumio Terakawa, Ibaraki; Hirokuni Nakatani, and Izumi Murozono, both of Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Sep. 20, 1979, Ser. No. 77,262
Claims priority, application Japan, Sep. 27, 1978, 53-119588
Int. Cl.[3] H04N 5/30
U.S. Cl. 358—213 8 Claims

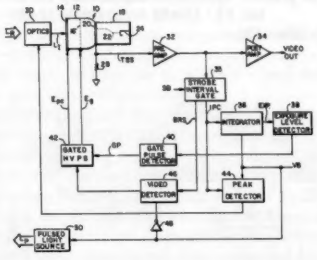


5. An electric charge transfer apparatus for transferring a fluctuating electric charge, said charge having a magnitude controlled by the amount of incident light received by a detector comprising: a capacitance element storing said electric charge, read means for detecting the electric charge on said capacitance element fluctuated in accordance with the radiation of light, and an auxiliary capacitance element provided between said capacitance element and said read means, said auxiliary capacitance element supplying a bias electric charge to said capacitance element, said bias electric charge improving the efficiency of charge transfer from said capacitance element to said read means.

4,291,338
AUTOMATIC EXPOSURE CONTROL FOR PULSED ACTIVE TV SYSTEMS

Larry A. Thomas, Pasadena, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1980, Ser. No. 144,811
Int. Cl.[3] H04N 5/26
U.S. Cl. 358—228 6 Claims



1. An exposure control system for television cameras of the type wherein a pulsed light source provides input illumination, comprising:

image tube means for converting the input illumination to an electrical video signal, said electrical video signal including a photocathode current signal;

switch means coupled to said image tube means for time-separating said photocathode current signal from said electrical video signal; and

first control loop means connected to said image tube means and said switch means for processing said photocathode current to determine the total instantaneous input illumination upon said image tube means so that said image tube means is gated off when the total instantaneous illumination reaches a predetermined level.

4,291,339

FACSIMILE TRANSCEIVER

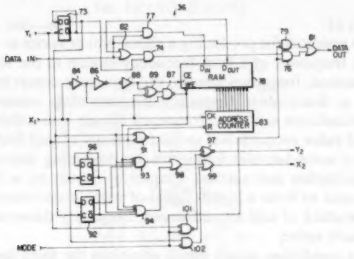
Mutsuo Ogawa; Noboru Murayama; Akira Konishi, and Norisada Takeuchi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,013

Claims priority, application Japan, May 16, 1977, 52-56775; May 16, 1977, 52-56777

Int. Cl.³ H04N *7/12*

U.S. Cl. 358—260 **9 Claims**



1. A facsimile apparatus having a transmitter and a receiver, the transmitter comprising:

a scanner for scanning an original document in two orthogonal directions and producing first binary data signals representing the document; and

an extractor for extracting relevant data from the first data signals and producing second data signals corresponding thereto in a number less than the first data signals; the receiver comprising;

an interpolator for sensing the second data signals and inserting data signals thereinto which correspond to the sensed data signals in a predetermined manner; and

a printer for reproducing the original document in response to the second data signals and inserted data signals;

the second data signals corresponding to logical sums of first data signals in corresponding positions in two adjacent scan lines;

the extractor being constructed to make a first data signal in a scan line logically low if a first data signal in a corresponding position in a preceding scan line which is adjacent to said scan line is logically high.

4,291,340

JET DROP COPIER WITH MULTIPLEX ABILITY

John W. Donahue, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 12, 1979, Ser. No. 75,064

Int. Cl.³ H04N *1/24;* G01D *15/18*

U.S. Cl. 358—296 **8 Claims**

1. Method of document reproduction comprising the steps of:

(1) viewing a picture frame within said document and projecting an image thereof toward an imaging plane,

(2) sensing said image and generating picture signals representing adjacent image columns collectively defining said image,

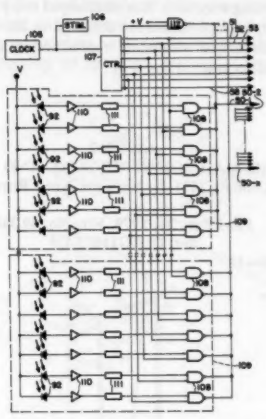
(3) scanning said image in the columnar direction while continuing to generate said picture signals,

(4) sampling picture signals representing image columns within groups of side-by-side image columns,

(5) multiplexing samples of said picture signals in each group to generate a plurality of printing control signals,

(6) forming a spaced arrangement of liquid printing streams corresponding in number to the number of said groups of photosensing elements,

(7) transporting a print receiving member through the printing region of said printing streams,



(8) scanning said streams cyclically sideward and producing a series of contiguous printing tracks,

(9) selectively directing said streams along catching paths in accordance with the information content of said printing control signals, and

(10) catching said streams when they are directed along said catching paths.

4,291,341

COMPOSITE RECORDING APPARATUS FOR RECORDING INFORMATION FROM DIFFERENT INFORMATION SOURCES

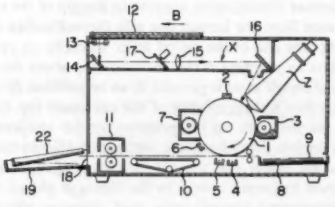
Tatsuo Yajima, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,424

Claims priority, application Japan, Aug. 18, 1978, 53-100012

Int. Cl.³ G03G *15/00;* H04N *1/22*

U.S. Cl. 358—300 **4 Claims**



1. In a recording apparatus for recording information on copy sheets from multiple sources and including a photosensitive medium, an optical system for projecting an image of an original to be copied onto the medium in an optical copying operation, reproducing means for producing an electrostatic latent image on the medium in accordance with an electric information signal in a reproduction operation, and a sheet receiving tray for receiving sheets discharged from the recording apparatus, and wherein receipt by the apparatus of an electric information signal during an optical copying operation

in progress initiates production on the medium of a latent image in accordance with the information signal upon completion of the optical copying operation then in progress, the improvement comprising:

at least a sorting tray movably connected to the receiving tray for receiving discharged copy sheets upon which information in accodance with electric information signals is recorded, and

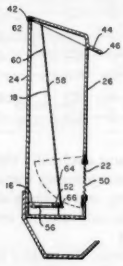
operative means for relatively moving the receiving tray and said sorting tray such that discharged copy sheets of optical copying operations are directed to the receiving tray and discharged sheets of reproduction operations are directed to said sorting tray.

4,291,342

TALKING MAILBOX STRUCTURE AND METHOD

Dermot O'Connor, 2311 N. Vermont Ave., Royal Oak, Mich. 48073

Filed Jun. 14, 1979, Ser. No. 48,349
Int. Cl.³ G11B *5/00*
U.S. Cl. 360—12 **1 Claim**



1. A mailbox comprising a substantially rectangular enclosure having a top thereon hinged at one side thereof for opening and closing on pivotal movement about the one side thereof, a message player in the bottom of the enclosure for accepting messages and playing them including a lever type on-off switch pivotally mounted at one end thereof for rotation about the pivotal mounting thereof to turn the message player on and off and resilient means for biasing the on-off switch into an off-position, and means operably associated with the enclosure top and message player for initiating playing of a message by the message player on opening of the mailbox comprising a linear member connected at one end to the top of the enclosure at a distance from the hinged one side thereof and at the other end to the free end of the on-off lever whereby on opening of the mailbox by pivoting of the enclosure top about the one side thereof the on-off lever is pivoted to an on position through the linear member and on closing of the enclosure top the on-off lever is pivoted into an off position by the resilient biasing means, a door in the front of the enclosure adjacent the bottom hinged at the upper side thereof for swinging movement into the mailbox to permit access to the message player having a sound transparent central area, said message player being positioned on the bottom of the enclosure and being of a size to permit free swinging movement of the door into the mailbox, said on-off lever and linear member are positioned adjacent one side of the enclosure so as not to interfere with the swinging movement of the door whereby a message may be provided for a mailman or the like by pre-recording the message on the message player in the mailbox so that the message player is turned on in response to the mailman opening the top of the mailbox, and turned off in response to the mailman closing the top of the mailbox.

4,291,343

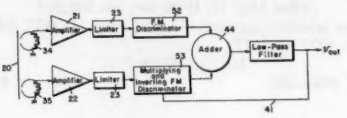
FREQUENCY-RATIO APPARATUS

Herbert S. Riddle, Jr., Nine Grant Cir., Sharon, Mass. 02067

Continuation-in-part of Ser. No. 828,425, Aug. 29, 1977, Pat. No. 4,148,078, which is a continuation of Ser. No. 681,759, Apr. 20, 1976, abandoned, which is a continuation of Ser. No. 459,071, Apr. 8, 1974, abandoned. This application Mar. 5, 1979, Ser. No. 17,360

The portion of the term of this patent subsequent to Apr. 3, 1996, has been disclaimed.

Int. Cl.³ G11B *5/04*
U.S. Cl. 360—30 **5 Claims**



1. Apparatus for producing a signal which varies as the ratio of the frequency of a first, frequency stream to the frequency of a second, frequency stream, the apparatus comprising:

(a) a first-stream frequency-discriminating means which transforms said first, frequency stream into a third signal of value proportional to the frequency of said first stream,

(b) a second-stream frequency-discriminating means which multiplies said second, frequency stream by a feedback value to form a fourth signal of value proportional to the product of said second-stream frequency times said feedback value,

(c) a combining means which combines the third and fourth signals and generates an output value proportional to the feedback value, and

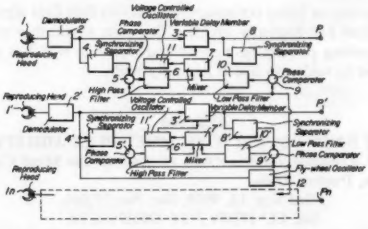
(d) a feedback loop which returns said feedback value to the second-stream frequency-discriminating means, whereby the feedback loop in said apparatus causes the output value to vary in a manner which is proportional to the ratio of the first-stream frequency divided by the second-stream frequency.

4,291,344

TIME BASE CORRECTING SYSTEM

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,457
Claims priority, application Japan, Nov. 18, 1978, 53-143078
Int. Cl.³ H04N *5/785*; G11B *27/10, 5/02*
U.S. Cl. 360—36 **3 Claims**



1. In a system for correcting time base for use in a fixed head type magnetic recording and reproducing apparatus, comprising a fixed head for picking up video signals, a demodulator for reproducing the picked video signals, a variable delay member for correcting time base variations of the reproduced video signals, characterized in means for comparing the output signals of the variable delay member with reference signals in order to detect time base variations caused by tape running irregularity in the reproduced video signals and the time base

variations caused by changes with time contained in output signals of the variable delay member, a low-pass filter and a mixer for feeding back the time base variation signals to the variable delay member to control the delay member, means for comparing the phase of input signals of the variable delay member with the phase of the reference signals to correct high frequency components of the time base variations which are removed by the low-pass filter, and a high pass filter for supplying the time base variation signals to the variable delay member to control the delay member.

4,291,345

CASSETTE TYPE TAPE RECORDER

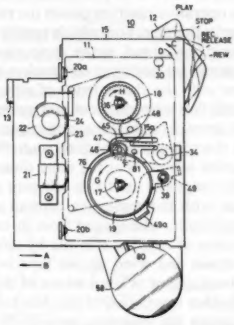
Tsunehisa Ohira, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 7, 1979, Ser. No. 73,526

Claims priority, application Japan, Sep. 12, 1978, 53/124993[U]; Sep. 12, 1978, 53/124994[U]

Int. Cl.³ G11B *15/12*

U.S. Cl. 360—62 **11 Claims**



1. In a cassette type tape recorder provided with a record control member manually operated for operating a record circuit when the tape recorder is to be set in the record mode, and a single main control member to be switched over and set in play, stop, and rewind positions, which are arranged in named order the improvement comprising:

a lock mechanism for locking said record control member in the operative position;

a mechanism for setting said main control member in a click stop manner in a specific record release position intermediate the stop position and the rewind position;

a mechanism for releasing said lock mechanism when said main control member is manually set in said specific position; and

a rewind mechanism operated when said main control member passes said specific position and is set at the rewind position.

4,291,346

OPTOELECTRONIC SYSTEM FOR DETERMINING THE POSITION OF A MAGNETIC HEAD TRANSDUCER ON A FLEXIBLE MAGNETIC RECORDING DISC

Harold J. Beecroft, Austin, and Max G. Davis, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1979, Ser. No. 45,142

Int. Cl.³ G11B *21/10, 5/55*

U.S. Cl. 360—75 **15 Claims**

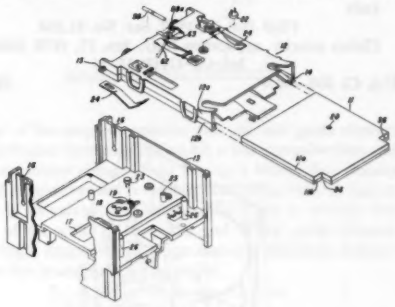
1. A system for reading and/or writing information on a sheet of flexible information storage media, said system comprising:

(a) a cartridge contaning said sheet of information storage media, said cartridge having a first opening for providing access to said media to impart rotational motion thereto and a second opening for providing access to a recording surface of said media to read and/or write information thereon;

(b) rotational means for extending through said first opening to engage said media and impart rotational motion thereto;

(c) a magnetic head transducer disposed in registration with said second opening for reading and/or writing information on the recordng surface of said media; and

(d) an optoelectronic system for optically determining the position of the head transducer with respect to the media in generating an electrical signal indicative thereof, said optoelectronic system having a movable shutter member with a plurality of apertures formed at predetermined



intervals thereon for being moved relative to a stationary mask member, light energy being permitted to pass through selected portions of said mask member in dependence upon the position of said head transducer, said shutter member being comprised of substantially the same flexible material as said media and being formed by cutting said flexible material diagonally with respect to a first axis of the flexible material so that the differences in the thermal and hygroscopic expansion coefficients of the material along the first axis from the corresponding expansion coefficients along a second axis are compensated for and the average thermal and hygroscopic expansion coefficients of the shutter member are substantially the same as those of said media.

4,291,347

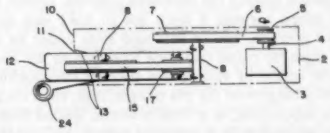
EIGHT TRACK TAPE ALIGNMENT INSTRUMENT

James T. Baroni, Box 113, Elton, Pa. 15934

Filed Feb. 27, 1980, Ser. No. 125,143

Int. Cl.³ G11B *15/66, 23/00*

U.S. Cl. 360—93 **5 Claims**



1. An eight track magnetic tape alignment instrument for use with a tape player including a housing having a motor driven capstan therein and formed with a generally rectangular cavity for receiving a generally rectangular tape cartridge having a magnetic tape wound and rotatable therein for conveyance over a cartridge wheel at one end of said cartridge, said wheel and said tape engaging with and being driven by said capstan, comprising an elongated narrow flat body, said body tapering from a relatively thick rear end to a near zero front end, ring-like hollow handle means integrally formed on and projecting

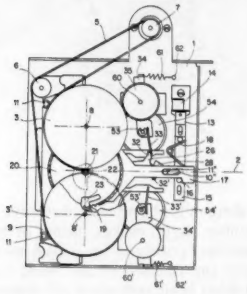
from said rear end whereby said handle means may be grasped between a finger and thumb of the same hand to wedgingly insert said tapered front end under the front of and for tilting the forward end of said cartridge upwardly and pushing said cartridge wheel end magnetic tape inwardly relative to said capstan to create a tighter driving fit therebetween and correct any misalignment of said tape and insure travel thereof at the desired speed to correct malfunctioning.

4,291,348

ACTUATING DEVICE FOR THE ADVANCEMENT OF THE TAPE IN A CASSETTE-TYPE TAPE RECORDING/PLAYBACK APPARATUS

Vittorio Pera, Rome, Italy, assignor to Autovox S.p.A., Rome, Italy

Filed Jun. 22, 1979, Ser. No. 51,098
Claims priority, application Italy, Jun. 27, 1978, 50036 A/78
Int. Cl.[3] G11B *15/26*
U.S. Cl. 360—96.4 **10 Claims**



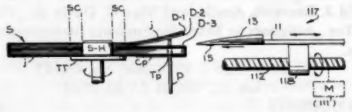
1. An actuating device for the advancement of the tape in cassette-type tape recording/playback apparatus of the type having a frame, two counter-rotating flywheels driven by a motor through a belt transmission, two capstans each of which is integral and coaxial with one of the flywheels, a pressure roller for each of the capstans, two hub-carrying disks, each driven by a friction wheel, rotatable about a pin fixed onto the frame, and there being defined on said plane of the frame a central axis equidistant from the axes of rotation of the two flywheels and equidistant from the axes of rotation of the two disks, which device is characterized by the fact of comprising: a slide constrained onto the frame so as to be able to translate in a parallel manner with respect to the center axis so as to assume alternatively an operative position and a rest position and urged by return springs toward the rest position; unidirectional motion transmitting means, which transmit the motion of a flywheel to the slide when it is in the rest position, to effect its translation toward the operative position, against the action of said return springs; a latch apt to hold said slide in the operative position, and to free said slide under an unlocking control signal to cause said slide to return to the rest position under the action of said return springs; two rocking levers, each freely hinged on the pin of each disk, each rocking lever rotatably supporting, in a fixed position, spaced from said pin, a pulley integral with a sprocket wheel, each rocking lever being able to effect an angular displacement such as to engage or disengage in entrainment said pulley with or from the flywheel which is located on its same side with respect to the center axis to effect or interrupt an entrainment contact with it, said sprocket wheel being in constant entraining engagement with said friction wheel, each rocking lever having an elastic ledge on the side opposite to said pulley with respect to said pin and being urged toward the disengagement position by spring means; an oscillating guide apt to effect an angular displacement between two set positions around a pivot integral to the frame, located on the center axis; a rocker member swinging about a pin secured to said slide and having an end apt to follow the profile of said guide and to push it toward its other set position, and having also two fingers each engageable with either of said elastic ledges of said rocking levers, depending on the position assumed by said guide, said rocker member having additionally thereon two legs, each engageable with either of the two pressure roller supports, depending on the position assumed by said guide; a magnetic head arm rotatably connected to the slide at one end and elastically connected to the slide at the other end so as to be elastically urged toward a position of engagement with the magnetic tape, of the recording/playback magnetic head secured to said magnetic head arm; two pressure roller supports rotatably connected with said slide, each of which rotatably supports a pressure roller, and urged elastically toward the respective capstan, said supports having a profiled end comprising an abutment for one of the legs of the rocker member so as to prevent, depending on the angular position assumed by the rocker member, an engagement of the pressure roller carried by the respective support, with the respective capstan, whereby, with the guide disposed in a first of its two set positions, the translation of the slide toward its operative position causes the rocker member to angularly move in the direction which results from following the profile of said guide and at the same time said guide be pushed in its second set position, said rocker member coming into engagement with the elastic ledge of either rocking lever, depending on said first set position of said guide, thus angularly displacing said lever, bringing the respective pulley into engagement with the respective flywheel and effecting the rotation of said friction wheel, as at the same time said translating slide actuates the magnetic head arm bringing a pressure roller into engagement with the respective capstan and maintaining the other pressure roller disengaged from its capstan, depending on the direction of rotation effected by said rocking member, so as to entrain and wind up the tape in one of its two directions of advancement, while a return of the slide in its rest position and a further translation of the slide toward the operative position, causes the magnetic tape to be advanced and wound in the direction opposite to the preceding one, depending on said second set position of the guide, and the winding of the magnetic tape at a fast speed is obtained by rotating the magnetic head arm against the action of its return spring, in the operative position of said slide.

4,291,349

DIVERTER MEANS FOR FLEXIBLE DISK PACK AND ASSOCIATED METHOD

Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 922,026, Jul. 5, 1978, abandoned, which is a continuation of Ser. No. 792,592, May 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 711,628, Aug. 4, 1976, Pat. No. 4,134,143. This application Jun. 5, 1979, Ser. No. 45,718
The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.
Int. Cl.[3] G11B *23/02, 25/04*
U.S. Cl. 360—98 **21 Claims**



1. An improved partitionable disk recording subsystem including:

a disk pack comprising a stack of flexible recording disks adapted to be co-rotated and to be partitioned, "end-wise"—that is normal to major disk surfaces—by thrust means

projected into the pack, and not "from the side"—that is, not from the direction of a disk edge;—the thrust means being adapted to cooperate with disk structure and comprising further means which preclude impeding of said disk pack structure during rotation thereof; the disk stack being arranged to generate at least one prescribed partition gap, each such gap exposing, at least partially, a respective disk recording surface for transducer operation; and

transducer assembly means adapted to be selectably projected into a selected one of said gaps, with the gap being maintained, partitioningly, while this assembly means presents at least one transducer-head means into transducing relation with the associated disk recording surface;

said assembly means including transducer actuator means adapted to selectively reciprocate said transducer head means into, and out of, said associated gap; as well as being operatively associated with at least one diverter means adapted to make initial entry into said partition gap and to maintain this gap during rotation of the pack, while shielding an associated transducer-head means protectingly.

4,291,350

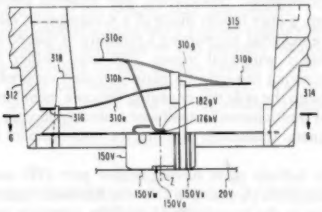
SPRING SUSPENSION FOR MAGNETIC TRANSDUCER

Francis K. King, San Jose, Calif., and Donald J. Wanek, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 974,600, Dec. 29, 1978, abandoned. This application Sep. 19, 1979, Ser. No. 76,719

Int. Cl.³ G11B *5/48, 21.16*

U.S. Cl. 360—104 **6 Claims**



1. A transducer suspension assembly comprising:

a rigid support,

a gimbal spring of thin flexible material attached to said support,

a transducer fixed to and thereby supported and carried by said gimbal spring, and

a backup spring of thin sheet spring material having a first leg fixed at one end thereof to said rigid support, a second leg connected serially with said first leg and folded back with respect to said first leg to permit flexure of said second leg in a pivotal direction opposite the pivotal direction of flexure of said first leg and a third leg connected serially with said second leg and folded back with respect to said second leg and having its distal end backing up said transducer and thereby applying a force on the transducer.

4,291,351

FLUX EXTENDER OR GUIDE FOR MAGNETIC READ HEAD HAVING A MAGNETORESISTIVE FLUX SENSOR

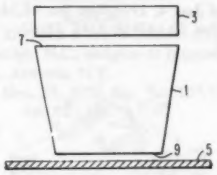
George F. Pennell, Vestal, N.Y.; Ralph D. Silkensen, Tucson, Ariz., and Joseph E. Wallace, Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,286

Int. Cl.³ G11B *5/30*

U.S. Cl. 360—113 **1 Claim**

1. A flux guide for a magnetic reading head having a magneto-resistive reading element spaced apart from the area of said head which contacts the reading medium, comprising a wedge shaped flux guide element spaced between said magneto-resistive element and said contact area, said guide element having its wider end closest to said magneto-resistive element, said wider end having a width substantially equal to that of the magneto-resistive element, each edge of said guide element being straight throughout its length, said guide element having a thickness which is constant and substantially greater than the



thickness of the magneto-resistive element, said guide element being fabricated from material which is less corrosive than said magneto-resistive element, and having a higher flux density than said magneto-resistive element, said guide element having a width at its narrow end substantially equal to seventy five percent of the width of the wider end of said guide element, and having a length which is less than the minimum distance between flux transitions in the media.

4,291,352

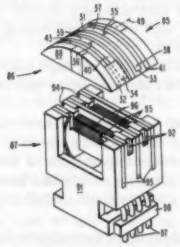
MULTICHANNEL TRANSDUCER STRUCTURE WITH IMPROVED INTERCHANNEL CROSS TALK REJECTION

Beverley R. Gooch, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 27, 1980, Ser. No. 125,001

Int. Cl.³ G11B *5/11, 5/22, 5/28*

U.S. Cl. 360—121 **17 Claims**



1. A multichannel magnetic transducer structure having a plurality of spaced transducing channels, each channel having a pair of magnetic poles defining a transducing gap therebetween, a magnetic back core contiguous with the poles and an associated transducing winding, comprising in combination:

a plurality of members of magnetic material firmly attached to said transducer structure at a front end surface thereof, each member being associated with one magnetic pole of each pair of poles and provided in close proximity thereof to form a low reluctance magnetic path therewith, each member extending substantially across said associated pole in the direction of a recording track width and provided at a distance from both said transducing gap and from an associated magnetic medium to prevent magnetic coupling therewith, respectively, said members of magnetic material being associated alternatively with poles located on the opposite sides of said transducer front end

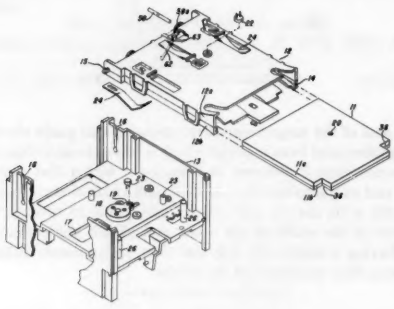
surface on consecutive adjacent channels to form an asymmetrical multichannel magnetic transducer structure.

4,291,353

SYSTEM AND METHOD FOR CLEANING A MAGNETIC HEAD TRANSDUCER

Robert L. Fletcher, Richardson; Richard D. VanLandingham, Garland; Sheldon H. Brown, Garland, and Alan H. Rittman, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1979, Ser. No. 45,141
Int. Cl.³ G11B *5/41, 23/02*
U.S. Cl. 360—128 **20 Claims**



1. A system for reading and/or writing information on a sheet of flexible information storage media, said system comprising:

(a) a sheet of flexible information storage media having opposite major surfaces, at least one of said major surfaces for recording information thereon;

(b) a recording cartridge in the form of a rigid envelope containing said media therein, said cartridge having a first opening for providing access to said media to impart rotational motion thereto and a second opening for providing access to said media for reading and/or writing information thereon;

(c) rotational means extending through said first opening for engaging said media and imparting said rotational motion thereto;

(d) a magnetic head transducer positioned in registration with said second opening for reading and/or writing information on a recording surface of said media; and

(e) an apparatus for cleaning said head transducer to remove debris and other contaminants therefrom, said apparatus comprising:

(i) a portable head cleaning cartridge in the form of a rigid envelope defining an internal chamber which contains a sheet of flexible abrasive material therein, said head cleaning cartridge for replacing said recording cartridge and said media when said head transducer is to be cleaned, said head cleaning cartridge having a first opening for permitting access to said sheet of abrasive material by said rotational means for imparting rotational motion thereto and a second opening for said head transducer to contact said abrasive material when said head cleaning cartridge is inserted into the system, said cartridge having a recess formed on an external surface thereof;

(ii) sensor means having a sensor member for mating with said recess when a head cleaning cartridge is inserted into the system to indicate that a head cleaning cartridge and not a recording cartridge has been inserted; and

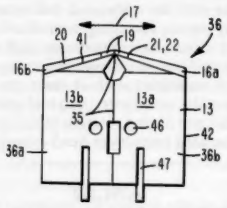
(iii) means for moving said head transducer back and forth across the surface of said abrasive material for a predetermined period while the sheet of abrasive material is being rotated, thereby removing debris and other contaminants from the head tranducer.

4,291,354

EXTENDED LIFE MULTICHANNEL MAGNETIC TRANSDUCER

James P. Chase, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jun. 4, 1979, Ser. No. 45,558
Int. Cl.³ G11B *5/11, 5/22, 5/27, 5/42*
U.S. Cl. 360—129 **15 Claims**



1. In a multichannel magnetic transducer assembly having a pole tip plate of a nonmagnetic material, formed of two corresponding half-tip plates abutting at a transducing gap plane, said half-tip plates each including a plurality of machined spaced parallel slots receiving a plurality of magnetic pole tips securely mounted therein, corresponding pole tips of each half-tip plate being mounted in registration with each-other having nonmagnetic transducing gap material disposed between them, a core holder made of a nonmagnetic electrically conductive material, supporting a plurality of spaced magnetic core members with coil means, said core holder having a surface receiving the pole tip plate in mated secured engagement and with the pole tips engaging the core members to form an integral multichannel transducer assembly having a plurality of magnetic transducer circuits, the improvement comprising:

(a) each half-tip plate having a first part **(19)** made of a nonmagnetic, wear-resistant, machineable material, extending in the transducer-to-medium interface area and a contiguous second part **(20)** made of a nonmagnetic, conductive, machineable material, said first part having a first **(21)** and a second **(35)** opposite planar surface, said second part **(20)** having a third planar surface **(22)** confronting with said first planar surface **(21)** of said first part **(20)**;

(b) a bond integrally joining said first **(19)** and second **(20)** parts at said respective confronting first **(21)** and third **(22)** planar surfaces;

(c) said plurality of parallel slots **(127)** extending transversely with respect to said integrally joined planar surfaces **(21; 22)**; and

(d) said corresponding half-tip plates **(16*a*; 16*b*)** being assembled with their respective first parts **(19)** abutting at said respective second planar surfaces **(35)** forming said transducing gap plane.

4,291,355

PROGRAMMABLE OVERLOAD CIRCUIT

Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

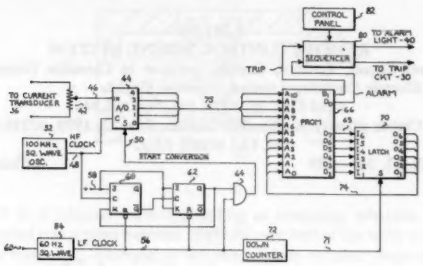
Filed Jul. 30, 1979, Ser. No. 61,683
Int. Cl.³ H02H *7/085*
U.S. Cl. 361—31 **15 Claims**

1. An overload protective circuit for a load drawing current from a power source and being operable to effect a predetermined operation in response to a thermal overload condition of said load comprising:

(a) digital memory means programmed with discrete multibit data words representative of the temperature charac-

teristic of said load for plural values of load current and being operable in response to an applied address signal corresponding to the value of the present load current and the present load temperature to provide a digital output signal having a predetermined number of bits representative of a predicted load temperature to be reached by said load in a predetermined elapsed time interval and at least one bit adapted to signal a predetermined temperature level being reached by said load;

(b) means providing and coupling a digital signal proportional to the absolute value of the load current to said memory means as a partial address signal;



(c) means coupled to said memory means and being operable to temporarily store said predetermined number of bits of said output signal for said predetermined elapsed time interval and thereafter feed said predetermined number of bits back to said memory means as a partial address signal corresponding to the present load temperature,

said partial address signals being applied concurrently as a composite address signal to said memory means; and

(d) means responsive to said at least one bit of said digital output signal and being adapted to effect said predetermined operation when said predetermined temperature level is signalled.

4,291,356

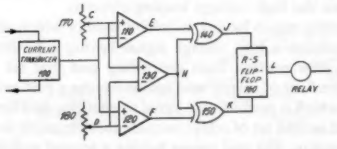
APPARATUS FOR ANALYZING A PHYSICAL QUANTITY

Serge Mathieu, Ste-Foy, Canada, assignor to h.o.p. Consulab Inc., Quebec, Canada

Filed Aug. 2, 1979, Ser. No. 63,093

Int. Cl.³ H02H *3/26*

U.S. Cl. 361—87 **5 Claims**



1. An apparatus for analyzing a physical quantity and for providing an indication of said quantity to an actuating element, comprising:

(a) means providing an input signal representative of said physical quantity;

(b) double adjustment means defining a pair of predetermined reference points, a first of said reference points determining a first value of said physical quantity for which said actuating element is to be energized, a second of said reference points determining a second value of said physical quantity for which said actuating element is to be de-energized;

(c) means comparing said input signal to said first and second values;

(d) a pair of EXCLUSIVE OR gates connected to said comparing means, one of said gates producing a given signal when said element is to be energized and the other of said gates producing a given signal when said element is to be de-energized;

(e) means responsive to said signals from said gates and said comparing means to provide an indication to said actuating element, said indication consisting of: energizing said actuating element, de-energizing said actuating element, or effecting no change to the state of said actuating element.

4,291,357

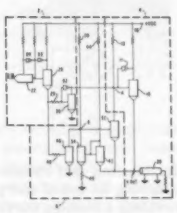
SHORT CIRCUIT PROTECTION CIRCUIT

Ju-Hi J. Hong, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 27, 1979, Ser. No. 107,734

Int. Cl.³ H02H *9/02*

U.S. Cl. 361—101 **7 Claims**



1. A short circuit protection circuit for a line driver comprising:

an output transistor having an emitter output for connection between a source and a load and developing an output voltage;

a first bias resistor connected between the source and the base of said output transistor;

a switching transistor connected between the base of said output transistor and the load for switching the bias of said output transistor for on and off operation thereof;

a voltage tracking transistor coupled across the load and connected to the base of said switching transistor;

a second bias resistor connected between the source and the base of said switching transistor for developing a voltage thereacross which is a function of the output voltage and which is used to bias said switching transistor;

a first and second inverting transistor for providing an input signal in parallel at the base of said switching transistor and at the base of said output transistor, respectively, said first inverting transistor providing a later input signal response at the base of said switching transistor than the signal response at the base of said output transistor thereby disabling said protection circuit during low voltage portions of the output signal rise time.

4,291,358

MAGNETIC VALVE WITH ELECTRONIC CONTROL

Heinrich Dettmann, Niedernhall, and Wolfgang Pfeiffer, Künzelsau-Garnberg, both of Fed. Rep. of Germany, assignors to Bürkert GmbH, Ingelfingen, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,930

Claims priority, application European Pat. Off., Jul. 6, 1978, 781000313.2

Int. Cl.³ H01H *47/10*

U.S. Cl. 361—154 **5 Claims**

1. An electronic control circuit for a magnetic valve having an energizing coil with two terminals for supplying an energizing current to said electronic control circuit comprising:

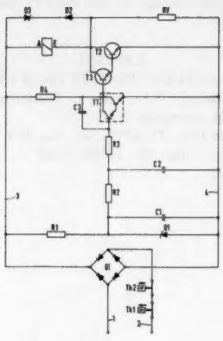
two input terminals for connection with said electric power source;

a full wave rectifier having two ac terminals and two dc

terminals, said ac terminals being connected to said input terminals;

a current limiting resistor mounted between one of said dc terminals and one of said coil terminals, the other of said coil terminals being connected with the other of said dc terminals;

a transistor switch, mounted in parallel with said current limiting resistor and having a control terminal;



a biassing circuit for biassing said transistor switch into its conductive state during an initial energization period of said valve by providing a biassing current to said control terminal; and

a timing circuit comprising a capacitor and a resistor for defining the duration of said initial energization period, said timing circuit being adapted to deactivate said biassing circuit at the end of said initial energization period.

4,291,359

SAFETY CIRCUIT FOR A POTENTIALLY DANGEROUS MACHINE MONITORED BY LIGHT

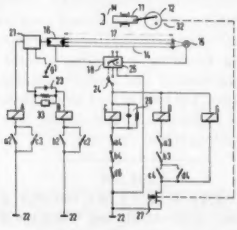
Gerhard Dieterle, Gutach, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,242

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2831089

Int. Cl.³ G01R *31/00*; H01H *49/00*

U.S. Cl. 361—173 **7 Claims**



7. Safety circuit for a potentially dangerous machine monitored by light, especially a machine having a drive circuit and which operates in a cycle between a dangerous position and a non-dangerous position and which is made safe by a light barrier or light curtain against intervention, said safety circuit including a first main relay which is energized when the region being monitored is free and which has a make contact located in the drive circuit of the machine, said safety circuit comprising a test circuit including a series of further relays, each having a plurality of compulsorily guided contacts at least one of each of which is disposed in the energizing circuit of at least one of the other relays whereby, during one working cycle of the machine, each relay is switched at least once from an energized to a de-energized condition whereby all relay contacts are switched in sequence at least once from an open to a closed position and wherein the interconnection of the relay contacts prevents a further cycle of machine operation if said sequence is interrupted due to one of the following causes:

(a) any relay contact sticking and

(b) untimely intervention in the monitoring light barrier.

4,291,360

REMOTE CONTROL WIRING SYSTEM

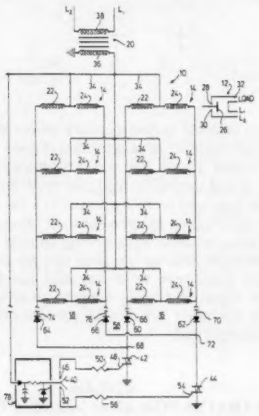
Tony Quant, Toronto, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 26, 1979, Ser. No. 106,840

Claims priority, application Canada, Feb. 23, 1979, 322184

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—189 **8 Claims**



1. In a remote control wiring system for remotely controlling a plurality of high voltage load circuits having a lower voltage wiring sub-system, said sub-system comprising:

a first set and a second set of low voltage relays movable in a first and a second direction to respectively open and close the high voltage loading circuits;

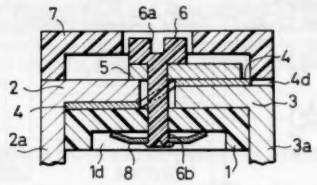
switching means having an inhibit state in which said means precludes a low voltage signal having a positive and a negative portion from energizing said first set and said second set of relays, said means having a first enable state in which it permits said signal to energize said first set and said second set of relays to cause them to move in said first direction, and said means having a second enable state in which it permits said signal to energize said first set and said second set of relays to move them in said second direction; and,

a circuit operable with said switching means for precluding the negative portion of said signal from energizing said first set of relays and for prc :luding the positive portion of said signal from energizing said second set of relays; said circuit including a first and a second current blocking device each respectively blocking the negative portion of the signal from energizing said first set of relays when said switching means is respectively its first and second enable states, and a third and a fourth current blocking device each respectively blocking the positive portion of said signal from energizing said second set of relays when said switching means is respectively in its first and second enable states.

4,291,361
TRIMMER CAPACITOR

Takashi Shirakawa, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,943
Claims priority, application Japan, Jun. 12, 1979, 54-799657[U]
Int. Cl.³ H01G 5/06
U.S. Cl. 361—293 3 Claims



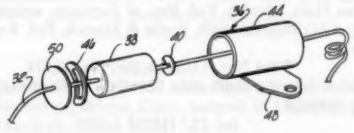
1. In a trimmer capacitor having an insulating substrate, a ground stator plate member disposed over half of the surface of the insulating substrate, a hot stator plate member disposed over the other half of the surface of the insulating substrate having its upper surface engaged with a dielectric film, and a substantially semicircular rotor plate member adapted to slide on both the stator plate members while being electrically connected with the ground stator plate member;

a trimmer capacitor characterized in that one half of said dielectric film is interposed between said hot stator plate member and said rotor plate member, while the other half of said dielectric film is interposed between said insulating substrate and said ground stator plate member.

4,291,362
FEED THROUGH CAPACITORS AND METHOD OF INSTALLING

Deane B. MacMillan, 1119 Wheaton Dr., Troy, Mich. 48099, and Carolyn L. Donigan, 685 Hickory Heights Dr., Bloomfield Hills, Mich. 48013

Filed Dec. 10, 1979, Ser. No. 102,063
Int. Cl.³ H01G 4/42
U.S. Cl. 361—302 4 Claims



4. An offset winding feed through capacitor comprising:

a central insulated lead line;

a contact disc-retainer clip comprising a generally flat element having prongs formed thereon adapted to penetrate the insulated lead line and to be crimped in position on said lead line;

a capacitor winding assembled with said lead line extending therethrough, with one end face of said winding in abutment against the crimped contact disc-retainer clip;

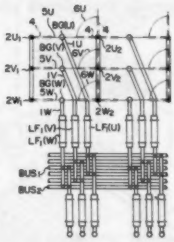
a metallic housing enclosing said winding and contact disc-retainer clip; and

an electrically conductive clip positioned against an opposite face of said capacitor winding in contact with the interior of said housing.

4,291,363
GAS-INSULATED SWITCHGEAR APPARATUS

Kazuaki Oishi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,098
Claims priority, application Japan, May 31, 1979, 54-67601; Jun. 1, 1979, 54-69284
Int. Cl.³ H02B 5/02
U.S. Cl. 361—333 6 Claims



1. A gas-insulated switchgear apparatus comprising:

(a) three-phase gas-insulated main buses extending substantially along a straight path;

(b) line feeder switching units corresponding to the three phases respectively, said line feeder switching units being arranged to extend in a horizontal direction orthogonal with respect to the axial direction of said gas-insulated main buses and connected at one end thereof to said gas-insulated main buses respectively;

(c) three entry gantries of respectively different heights for anchoring three-phase AC power transmission lines respectively while maintaining a required vertical open-air insulation distance between said power transmission lines, said entry gantries being spaced apart from each other by a predetermined open-air insulation distance in said horizontal direction and disposed in such a relation that a taller one of them anchors a higher one of said power transmission lines and is located at a position remoter than that of the next adjacent one in the incoming direction of said power transmission lines;

(d) bushings connected to the other end of said three-phase line feeder switching units respectively, each of said bushings being connected with the corresponding entry gantry of the same phase while being spaced apart from the next adjacent one by a predetermined open-air insulation distance in said horizontal direction;

(e) means for anchoring said power transmission lines to said entry gantries in such a relation that the higher one of said power transmission lines is anchored to the taller one of said entry gantries; and

(f) incoming lines electrically connecting said power transmission lines of the three phases to the external terminals of said bushings of the corresponding phases respectively.

4,291,364
AIR-COOLED HYBRID ELECTRONIC PACKAGE

Frank E. Andros, Binghamton; Ghazaros K. Kerjilian; Bert E. Stevens, both of Vestal, and Reinhold E. Tomek, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,966
Int. Cl.³ H05K 7/20
U.S. Cl. 361—384 4 Claims

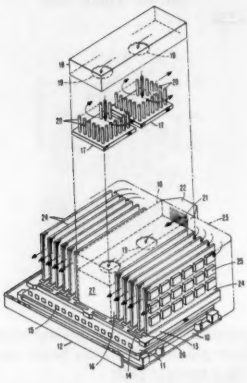
1. A hybrid electronic package assembly which comprises:

a chamber housing a plurality of first circuit modules mounted on a planar printed circuit board;

a plurality of printed circuit cards arranged vertically on opposite sides of said chamber and having a plurality of second circuit modules mounted thereon;

a top air plenum located over said chamber and having bottom openings located directly over each of said first circuit modules;

means supplying a flow of air into said top plenum, said air flowing through said openings and impinging against the top of each of said first circuit modules; and



a back air plenum connected to the back of said chamber directing the air flow out of said chamber, through said back plenum, and across said circuit cards and said second circuit modules.

4,291,365

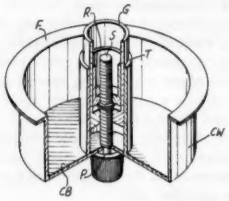
SIGNAL LANTERNS FOR OPTIONAL COLORED LIGHT EMITTANCE

Amar N. Tandon, P.O. Box 189 Aishbagh, and Ram B. Bhasin, 3/2 Talkatora Colony, both of Lucknow, India

Filed Jan. 28, 1980, Ser. No. 115,791

Int. Cl.³ F21V 9/00

U.S. Cl. 362—281 **8 Claims**



1. Attachment for a lamp, particularly for a signalling lamp, said lamp including a reflector, such as a flashlight, said attachment adapted to be mounted opposite light source, such as bulb, of the lamp, and comprising two co-axial substantially transparent tubular bodies having mutual guide means so as to be movable along their common axis, said tubular bodies being held in support-cum-guide means adapted to be mounted on face (reflecttor side) of the lamp and rotary means such as herein described to advance on rotation thereof (said rotary means) in one direction of one or the first tubular body to envelope the light source, such rotation causing retraction of the second tubular body if it already enveloped the light source and un-covering of the latter, while rotation of the rotary means in the other direction causing said first tubular body to retract and uncover the light source and the second tubular body to advance and cover the said light source, each said tubular body or at least that portion of each as will cover the light source being of different colour.

4,291,366

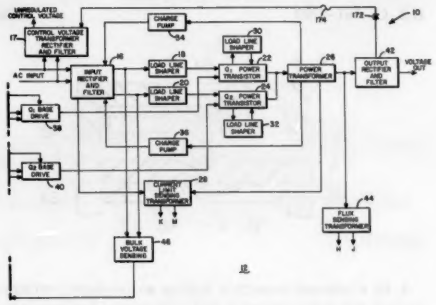
SWITCHING REGULATED POWER SUPPLY

Hilding E. Nelson, Scandia, Minn., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 24, 1979, Ser. No. 78,352

Int. Cl.³ H02M 7/217

U.S. Cl. 363—17 **15 Claims**



8. A switching regulated power supply comprising:

(a) power head means for converting an alternating current voltage to direct current voltage, including an input rectifier and filter capacitor means for developing an unregulated direct current voltage from said alternating current voltage input, a pair of power transistors connected to said input rectifier and filter capacitor means, a power transformer connected to said power transistors, and an output rectifier and filter connected to said power transformer;

(b) charge pump means for equalizing voltage charge on said input rectifier and filter capacitor means, coupled between said power transformer and said input rectifier and filter capacitor means;

(c) control logic means for alternately switching said power transistors and a control voltage means for supplying power to said control logic means; and

(d) power feedback means for regulating the direct current output voltage from said power head means, connected between said power head means and said control voltage means, whereby said power feedback means provides control voltage power to said control voltage means.

4,291,367

POWER SUPPLY CIRCUIT WITH A SELF-OSCILLATING BLOCKING OSCILLATOR

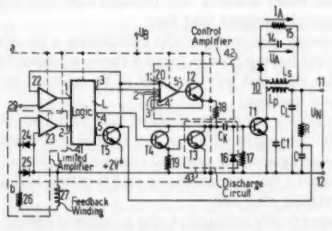
Roman Haas, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,674

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849619

Int. Cl.³ H02M 3/335

U.S. Cl. 363—21 **4 Claims**



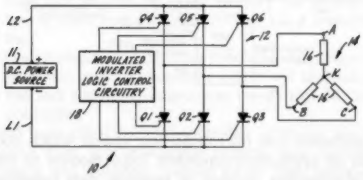
1. A self-sustaining blocking oscillator power supply circuit,

comprising: a primary circuit formed of a DC supply voltage connected to a switching transistor through a primary of a transformer; rectifying means connected to a secondary of the transformer for producing a DC output voltage; regulating circuit means connecting to a control input of the switching transistor for controlling the switching transistor as a function of a comparison voltage derived from the primary circuit; an integration means connected parallel to the DC supply voltage for producing a periodic, approximately sawtooth-shaped signal which substantially corresponds to a current flowing in the primary circuit at the primary of the transformer, the sawtooth-shaped signal driving the regulating circuit means for triggering of the switching transistor; and the integration means comprising an RC member connected to be discharged via a switch means for synchronous operation with the switching transistor.

4,291,368
PULSE-WIDTH MODULATED INVERTER SYSTEM AND METHOD

Raymond J. Yarema, Glen Ellyn, and George H. Studtmann, Mount Prospect, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 30, 1979, Ser. No. 25,417
Int. Cl.³ H02M 1/12
U.S. Cl. 363—41 **20 Claims**



1. A pulse-width modulated inverter system for providing three-phase power to a load at a preselectable output frequency and a preselectable output voltage, said inverter system including voltage control apparatus comprising in combination:

a power supply having positive and negative supply terminals;

switching means for operatively connecting said power supply to a load having A, B and C output terminals; and

modulated control means for activating said switching means to produce waveforms at said output terminals having at least one pulse of a variable width disposed symmetrically about the center point and only in the middle 60° portion in each half cycle thereof.

4,291,369
VOLTAGE MULTIPLIER AND DRIVER CIRCUIT

Paul E. Hochstrate, Bristol, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sep. 19, 1979, Ser. No. 77,258
Int. Cl.³ H02H 7/25
U.S. Cl. 363—60 **8 Claims**

1. A voltage multiplier and driver circuit energized by a DC supply voltage source comprising:

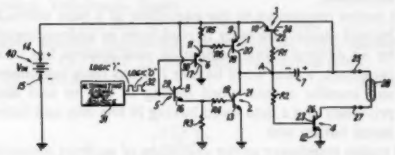
means for providing an alternating control signal;

first and second switch means connected in series across the DC supply voltage source each being responsive to the alternating control signal for alternately connecting first and second terminals of the DC supply voltage source to the connection between said first and second switch means defining a junction;

a capacitor connected between a first terminal for a load device to be energized and the common junction between said first and second switch means;

third switch means connected between the first terminal of the DC supply voltage source and a second junction between the capacitor and the first terminal for a load device and responsive to said control signal for periodically connecting the first terminal of the DC supply voltage to said second junction; and

fourth switch means connected between the second terminal of the DC supply voltage source and a second terminal for a load device and responsive to said control signal for periodically connecting the second terminal for a load device to the second terminal of the DC supply voltage source; whereby during each alternate half cycle of the

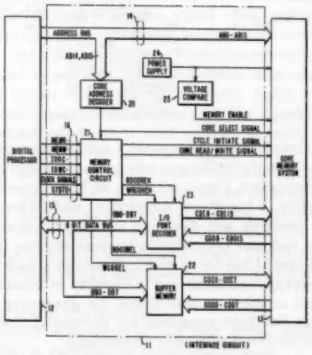


alternating control signal the second and third switch means are rendered conductive to connect the capacitor in parallel circuit relationship across the DC supply voltage source and thereby charge the capacitor to the voltage of the supply voltage source with the first and fourth switch means being maintained off, and during the remaining alternate half cyles of the control signal the first and fourth switch means are rendered conductive with the second and third switch means turned off to thereby connect the DC supply voltage source and the capacitor in its charged state in series circuit aiding relationship across the load device terminals.

4,291,370
CORE MEMORY INTERFACE FOR COUPLING A PROCESSOR TO A MEMORY HAVING A DIFFERING WORD LENGTH

Larry L. Charles, Fallston, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 23, 1978, Ser. No. 936,299
Int. Cl.³ G06F 13/00, 5/00
U.S. Cl. 364—200 **4 Claims**



1. An interface circuit for coupling a digital processor having an address bus, an N bit data bus and a data word length of N bits to a memory having 2 N bit data input and data output buses, an address bus and a data word length of 2 N bits where N is an integer, comprising:

(a) means for coupling said address bus of said processor to said address bus of said memory;

(b) an N bit bidirectional buffer coupling the data bus of said

digital processor to the data input and data output buses of said memory;

(c) means responsive to the execution of an output instruction by said digital processor to transfer a data word having N bits from said processor into said bidirectional buffer;

(d) means responsive to the execution of a store instruction by said digital processor to transfer said data word having N bits stored in said bidirectional buffer and a data word having N bits from said processor into said memory as a data word having 2 N bits at a storage location determined by an address signal present on said address bus of said processor;

(e) means responsive to the execution of a read instruction by said digital processor to read from an address specified by an address signal present on said address bus of said processor, a data word having 2 N bits from said memory and transfer a data word having N bits to said ditigal processor and a data word having N bits into said bidirectional buffer; and

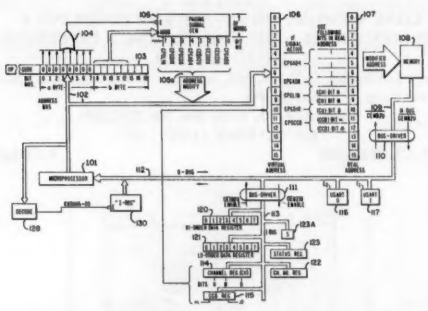
(f) means responsive to the execution of an input instruction by said digital processor to transfer a data word having N bits from said bidirectional buffer into said processor whereby;

(g) said interface circuit couples said N bit data bus of said processor to said 2 N bit data input and data output buses of said memory.

4,291,371
I/O REQUEST INTERRUPT MECHANISM

Thomas O. Holtey, Newton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1979, Ser. No. 315
Int. Cl.[3] G06F *7/00*
U.S. Cl. 364—200 **6 Claims**



1. In a computer system having a microprocessor (μP) for executing channel routines and subroutines, a U-bus coupled to said microprocessor, a main memory, an M-bus coupled to said main memory, a bus-driver coupled to said M-bus and said U-bus for enabling and disabling information flow between said M-bus and said U-bus, an instruction register (I-register) coupled to said U-bus for storing instructions which initiate or obviate interrupt operation and a plurality of communication devices also coupled to said U-bus for generating interrupt requests, an interrupt apparatus for processing interrupt requests, said interrupt apparatus comprising:

(a) first means for generating signals forming a predetermined address at the end of every channel subroutine;

(b) second means coupled to said μP for interrupting said μP, said second means being enabled by said predetermined address signals;

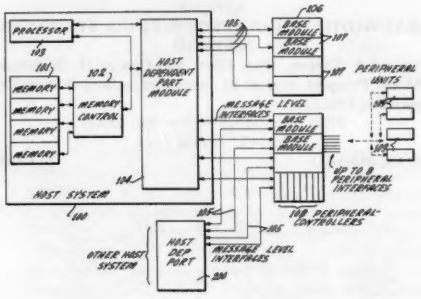
(c) third means for deriving signals forming the next sequential address from said predetermined address, said next sequential address signals used for enabling said I-register to transfer said instructions to said U-bus and for disabling said bus-driver, whereby a normal memory read data path including said M-bus and said bus-driver is disabled; and

(d) fourth means coupled to said I-register and to said plurality of communication devices for intercepting an interrupt request from one of said plurality of communication devices and for forming said instructions in said I-register.

4,291,372
MICROPROCESSOR SYSTEM WITH SPECIALIZED INSTRUCTION FORMAT

Brian K. Forbes, Huntington Beach, and Robert D. Catiller, Garden Grove, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 27, 1979, Ser. No. 52,350
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—200 **7 Claims**



1. A universal-type microprocessor system which cooperates with an application-dependent logic module to form a peripheral-controller capable of handling data transfers between main memory of a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented", and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic module further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling said external register means, said external memory and communicating with a decoder-controller in said microprocesor system, the said microprocessor system comprising:

(a) data processing means including:

(a1) an Arithmetic Logic Unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) said shift logic circuit providing output to an I/O bus, said shift logic circuit functioning to rotate one or more bits of a word being processed to the right or to the left;

(a3) said byte-swap circuit providing output to said I/O bus, said byte-swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

(b) said I/O bus providing connection lines from said data processing means to said external register, to said external memory, to an accumulator register means, and to an addressing means;

(c) addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an internal memory or said external memory, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in said internal program memory;

(c2) a memory reference register connected to said decoder-

controller for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to the said external memory;

(c2-2) and wherein a dedicated non-address bit (byte-select bit) in said memory reference register being set to signal said decoder-controller to initiate a byte-swap operation in said byte-swap circuit, or when not-set, to pass data without a byte-swap operation;

(c2-3) a bus connection from said memory reference register to said decoder-controller;

(c3) an address register in said decoder-controller connecting by means of an address bus to said accumulator register means, which include a plurality of accumulator registers, for selection of an addressed accumulator register as a destination for data or as a source of data;

(d) said internal program memory for storing program instructions and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and memory operand register;

(e) register means for temporary storage of data, said register means including;

(e1) said plurality of addressable accumulator registers which provide an output to the input of said Arithmetic Logic Unit, said accumulator registers receiving input data words from said I/O bus;

(e2) a memory operand register for receiving operand data from said internal program memory via an instruction bus or from said external memory via a memory data bus;

(e3) an instruction register for receiving instruction words from said internal program memory via said instruction bus and providing instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register, and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means, said instruction decoder-controller further including:

(i) circuitry responsive to each data field of an instruction word for executing the requirements of each of said data field;

(g) said external memory data bus for carrying data from said external memory to said instruction register and said memory operand register;

(h) an instruction word format in said internal program memory which includes:

(h1) a basic function instruction field for initiating transfer of the contents of a selected register to another selected register or for selecting an Arithmetic Logic Unit operator or a program stack operator;

(h2) a variant function field for initiating selection of:

(i) an addressed external register for a GET operation or a PUT operation;

(ii) an Arithmetic Logic Unit OP code or

(iii) a condition test or program stack operator;

(h3) a destination field for:

(i) placement of data resulting from GET and Arithmetic Logic Unit operators;

(ii) placement of data resulting from PUT and Program Stack operators;

(h4) a source field for initiating selection of data for:

(i) an Arithmetic Logic Unit or PUT operation;

(ii) a GET operation;

(iii) a Program Stack operation;

(h5) a bit field for parity information;

(h6) a single bit field "M" for signaling said decoder-controller to select either said program counter or said memory reference register as an address source for operands of the current instruction;

(h7) a single bit field "C" for signaling said decoder-controller to initiate or not initiate the said Arithmetic Logic Unit to copy its output into said memory reference register.

4,291,373

NAVIGATIONAL INFORMATION ANNOUNCING SYSTEM FOR MOTOR VEHICLE

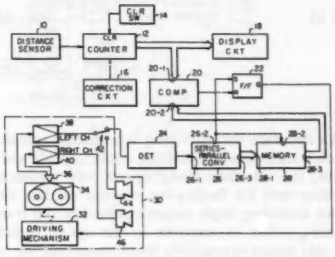
Masanori Mizote, Yokosuka; Kiyoshi Yamaki, Yokohama; Takashi Oka, Tokyo; Hideoki Matsuoka, Yokohama; Hiroyuki Nomura, Yokohama, and Takaaki Mogi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 19, 1979, Ser. No. 4,992

Claims priority, application Japan, Jan. 20, 1978, 53-5619

Int. Cl.[3] **G06F** *15/50;* **G08G** *1/12;* **G11B** *5/00*

U.S. Cl. 364—443 **8 Claims**



1. A navigational information announcing system for a motor vehicle comprising:

(a) first means for producing a first signal indicative of a measured distance travelled by a motor vehicle;

(b) a tape player for reproducing first and second data respectively pre-recorded on a magnetic tape, said tape player including a tape driving mechanism, said first datum including plural pieces of distance information along a predetermined course, said second datum including plural pieces of navigational information in audio form;

(c) second means responsive to said first datum, said second means producing a second signal upon termination of reproduction of one of said plural pieces of distance information and a third signal indicative of a reference distance expressed by said one piece of distance information;

(d) third means for producing a fourth signal when said measured distance indicated by said first signal has a predetermined relationship with respect to said reference distance indicated by said third signal;

(e) fourth means for controlling said tape driving mechanism of said tape player, said fourth means causing said tape driving mechanism to establish a pause operation in response to said second signal and to re-establish a normal playback operation in response to said fourth signal so as to reproduce one of said pieces of navigational information;

said second means comprising:

(a) a detector responsive to said first datum which is pre-recorded in the form of binary coded data;

(b) a series-parallel converter responsive to the output data of said detector, said series-parallel converter producing a binary coded datum in parallel form, said series-parallel converter producing a memory control signal when series-parallel conversion of a predetermined number of bits is completed; and

(c) a memory responsive to the output data of said series-parallel converter, said data being stored in response to said memory control signal.

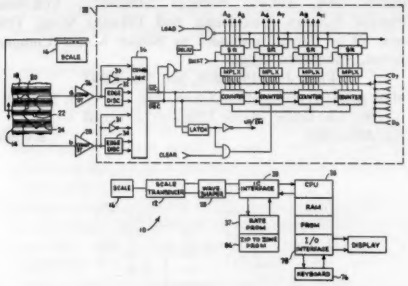
4,291,374
MAILING SYSTEM

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 927,705, Jul. 24, 1978, Pat. No. 4,179,747, which is a division of Ser. No. 750,534, Dec. 14, 1976, Pat. No. 4,131,946. This application Jun. 5, 1979, Ser. No. 45,791

Int. Cl.[3] **G01G** *3/00;* **H03K** *21/00*

U.S. Cl. 364—466 **2 Claims**



1. An interface for providing information transfer channels between a transducer generating cyclic signals and a processing unit, the interface being operatively connected to said processing unit for facilitating transfer of data thereto, said interface including logic means coupled to the transducer for generating pulses in response to the cyclic signals, counter means and means operatively interconnecting the logic means and the counter means, the interface further including register means adapted to receive counter information from said counter means and control means adapted to prevent the transfer of counter information to the register means during propagation of a count through the counter means from the logic means, the control means comprising timing means coordinated with count propagation time of the counter means for storing a time interval and means monitoring the cyclic signals, said monitoring means being adapted to actuate the timing means when said propagation of said count through said counter means occurs, inhibiting means for inhibiting the counter information from being transferred to said register means until a predetermined time interval after completion of said count propagation has elapsed.

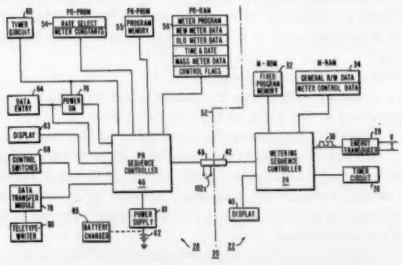
4,291,375
PORTABLE PROGRAMMER-READER UNIT FOR PROGRAMMABLE TIME REGISTERING ELECTRIC ENERGY METERS

Thomas G. Wolf, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1979, Ser. No. 25,514

Int. Cl.[3] **G01R** *21/00;* **G06F** *15/56, 15/20*

U.S. Cl. 364—483 **22 Claims**



1. A programmer-reader unit for a programmable time registering AC electric energy meter including a transducer producing pulse signals related to an electric energy quantity to be measured, a clock producing real time data, a memory containing program control data, said program control data including constant data items representative of metering rates and variable data items representative of real time categories, a meter sequence controller comparing said real time data to said variable data items and selecting a constant data item in response to said comparison, said metering sequence controller accumulating said pulse signals in response to said selected constant data item, and an external data communications interface responsive to said sequence controller, said programmer-reader unit comprising:

first memory means including memory locations for storing meter programming input data items transmittable to said meter;

second memory means including memory locations for storing meter output data items receivable from said meter, said data items including said accumulations of said metering pulses;

timer circuit means generating regularly occurring timing signals;

means generating, independently of said meter, reference real time data in response to said timing signals and storing said reference time data at a predetermined data item memory location of said first memory means;

bidirectional communication interface means for communicating with said external data communications interface of said meter, said communications including the transfer of the data items of said program control data from said meter to said memory locations of said second memory means for meter output data items and the transfer of the meter programming input data items from said memory locations of said first memory means to said meter thereby replacing predetermined ones of said data items of said program control data utilized by said meter including the real time data items so as to program said meter with said reference time data during each transfer of data between said meter and said unit;

data comparison means for measuring time differences between the real time data items received from said meter and stored in said second memory means and said reference real time data produced by said means generating said reference real time data; and

error indicating means responsive to a predetermined value of time difference measured by said data comparison means.

4,291,376
DIGITAL ENERGY MONITOR

David I. McCahill, Champion, Pa., assignor to Three Rivers Enterprises, Inc., Pittsburgh, Pa.

Filed Aug. 8, 1979, Ser. No. 64,789

Int. Cl.[3] **G06F** *15/20;* **G01R** *21/06;* **G05B** *15/00;* **H02J** *3/14*

U.S. Cl. 364—483 **6 Claims**

1. A digital apparatus for generating a log of energy usage for instant recall and analysis comprising:

(a) a microprocessor having an interrupt capability with associated read-only memory, read/write (RAM) memory, data, address, and control buses;

(b) a timer connected with said microprocessor to provide continuous real-time/date data;

(c) a keyboard and keyboard encoder connected with said microprocessor for establishing certain initial conditions in the read/write memory and for selecting certain displays and functions;

(d) a display and display controller connected with said microprocessor for displaying data;

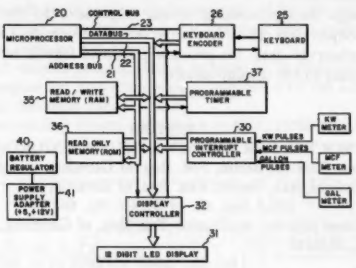
(e) an interrupt controller connected with said microprocessor, said interrupt controller having a plurality of input terminals connectable with the pulse outputs of energy metering devices;

said read-only memory permanently programmed

(i) with a task to cause the microprocessor to have a continuously updated date and time stored at a selected location in the read/write memory,

(ii) with a task to process each interrupt corresponding to each pulsed input to add one unit to a read/write memory location corresponding to the date and the particular input terminal, and

(iii) with a task to select and display the contents of the memory locations corresponding to date or dates and particular input terminals.



4,291,377

APPARATUS FOR MEASURING ELECTRICAL POWER

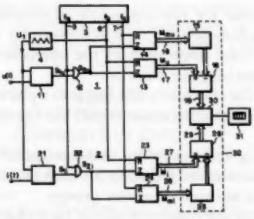
Gernot Schneider, Baar, and Benedikt Steinle, Zug, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG., Zug, Switzerland

Filed Nov. 2, 1979, Ser. No. 90,734

Claims priority, application Switzerland, Nov. 13, 1978, 11634/78

Int. Cl.³ G01R *11/32*

U.S. Cl. 364—483 **11 Claims**



1. An apparatus for measuring power delivered at an alternating voltage by an alternating current to a load comprising in combination:

sampling means for periodically sampling the alternating voltage and the alternating current delivered to the load at selected sampling points,

converter means, including impulse generator means, for converting the sampled points to first and second sequences of a plurality of pulses, the number of pulses in each sequence being substantially proportional to the instaneous values of the alternating voltage and of the alternating current, respectively,

first counting means for counting the first sequence of pulses,

second counting means for counting the second sequence of pulses,

averaging means for determining the average value of said first and second sequence of pulses, respectively, over at least one period of the alternating current,

subtractor measns for obtaining difference values between said average value, and said first and second sequences of pulses, respectively,

multiplier means for multiplying said respective difference values, to obtain successive product values,

integrating means for integrating said successive product values over said at least one period so as to measure the power delivered to said load, whereby any error in determining said average value is eliminated from the power measurement.

4,291,378

STEAM POWER PLANT AND CONTROL ELEMENT FOR THE PLANT

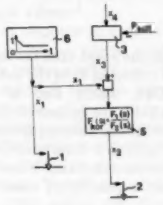
Karel Skala, Windisch, Switzerland, assignor to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed Mar. 16, 1979, Ser. No. 21,309

Claims priority, application Switzerland, Mar. 21, 1978, 3057/78

Int. Cl.³ F01D *19/00, 17/00*

U.S. Cl. 364—494 **12 Claims**



1. A steam turbine plant comprising:

an intake valve;

a by-pass valve; live-steam generation means for supplying steam to both the intake and the by-pass valves;

regulating circuit means for controlling the opening and closing of both the intake and the by-pass valves in accordance with first and second transfer functions, respectively; and,

a correction element for one of the by-pass and the intake valves, said correction element having a transfer function which modifies one of said first and second transfer functions such that the modified transfer function is approximately equal to the other of said first and second transfer functions.

4,291,379

METHOD AND AN INSTALLATION FOR REGENERATING MOLDING SANDS

Renzo Cappelletto, 57 rue de Foussard, Tavers, 45190 Beaugency, and Jean Willame, 66 avenue de Ferriere, 59131 Rousies, both of France

Filed Nov. 1, 1979, Ser. No. 90,449

Claims priority, application France, Nov. 10, 1978, 78 31830

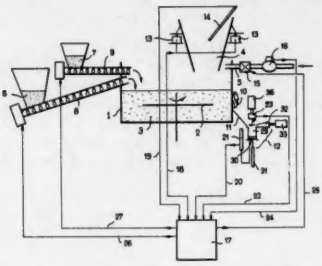
Int. Cl.³ G06F *15/46*

U.S. Cl. 364—506 **4 Claims**

2. An installation for automatically regenerating molding sands comprising a pug mill adapted to receive the spent sand, means for automatically and intermittently withdrawing a cylindrical test sample of sand from the spent sand contained in said pug mill, means for automatically and intermittently measuring the compactibility of the test sample by determining the reduction of height of said sample under the action of a predetermined force, means for automatically measuring the compressive strength of the test sample which has been subjected to the precedent measurement, means for determining the quantity of water which must be added to the spent sand for its regeneration by the following relation:

$$V=P[K(ASV-ASM)+BT]$$

where V is the volume of water, P is the weight of sand, K is a coefficient which varies between 0 and about 0.2 according to the nature of the sand, ASV is the contemplated degree of compactibility, ASM is the measured compactibility, BT is a correction factor for temperature and varies between 0 and about 2%, means for determining the quantity of bentonite



which must be added to the spent sand for its regeneration, by calculating an index of cohesion Ic of the sand by means of the relation: $Ic=Rec/(ASM)$, where Rec is the compressive strength of the sand, ASM is the measured compactibility, said index Ic is compared with the contemplated index Ic and the quantity of bentonite required is determined so as to adjust the measured index Ic to the contemplated index Ic, and means for adding to the spent sand a quantity of water and bentonite as determined above.

4,291,380

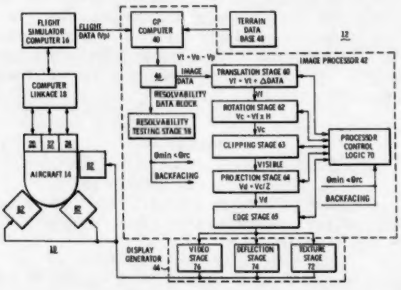
RESOLVABILITY TEST AND PROJECTION SIZE CLIPPING FOR POLYGON FACE DISPLAY

Michel Rohner, San Jose, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed May 14, 1979, Ser. No. 38,617

Int. Cl.[3] G09B *9/08;* **H04N** *7/18*

U.S. Cl. 364—522 **12 Claims**



1. An image system for providing selected image data to a display device which displays polygon object faces as viewed from an observation point in simulated relative motion with the polygon object faces, by combining object data defining the positions of the vertices of the polygon object faces with the observer data defining the position and orientation of the observation point relative to the object faces, and eliminating the data representing polygon object faces having a display size less than a minimum predetermined size, the image system comprising:

object data base means for providing the object data;

resolution standard means for defining the minimum predetermined size;

resolvability means responsive to the object data and to the observer data for determining the display size of each polygon face, and responsive to the resolution standard means for eliminating from the flow of the object data representing polygon faces the data representing those faces having a size less than the minimum predetermined size; and

image data processing means responsive to the polygon object data remaining in the flow of object data and to the observer data, for providing control signals and display data to the display device.

4,291,381

PROCESS FOR RUNNING WIDTH ADJUSTMENT

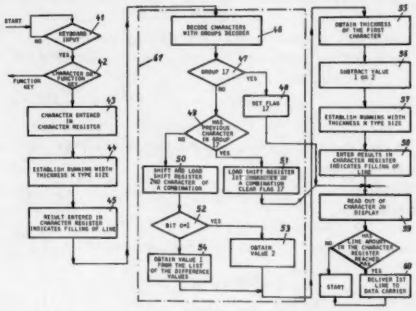
Helmut Siebeck, Berlin, Fed. Rep. of Germany, assignor to H. Berthold, AG., Berlin, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 66,097

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2836317

Int. Cl.[3] G06F *15/20*

U.S. Cl. 365—523 **10 Claims**


START
KEYBOARD INPUT
CHARACTER OR FUNCTION KEY
FUNCTION KEY
CHARACTER ENTERED IN CHARACTER REGISTER
ESTABLISH RUNNING WIDTH THICKNESS X TYPE SIZE
RESULT ENTERED IN CHARACTER REGISTER INDICATES FILLING OF LINE
DECODE CHARACTERS WITH GROUPS DECODER
GROUP 17
SET CLAS 17
LAST PREVIOUS CHARACTER IN GROUP
SHIFT ARS LOAD SHIFT REGISTER 2ND CHARACTER OF A COMBINATION
LOAD SHIFT REGISTER 1ST CHARACTER OF A COMBINATION CLEAR FLAG 17
BIT 0=1
OBTAIN VALUE 1 FROM THE LIST OF THE DIFFERENCE VALUES
OBTAIN VALUE 2
OBTAIN THICKNESS OF THE FIRST CHARACTER
SUBTRACT VALUE 1 OR 2
ESTABLISH RUNNING WIDTH THICKNESS X TYPE SIZE
ENTER RESULTS IN CHARACTER REGISTER INDICATES FILLING OF LINE
READ OUT OF CHARACTER IN DISPLAY
LINE APPROACHES TO THE CHARACTER REGISTER LIMIT
START
DELIVER 1ST LINE TO DATA CARRIER

1. A process for running width adjustment of adjacently positioned characters in a photocomposing machine to enhance the visual impression of the composed material, said process comprising the steps of:

assigning the characters of a font into a plurality of groups in accordance with their suitability for running width adjustment;

establishing the possibility and amount of running width adjustment to be provided for each combination of adjacently positioned character groups;

determining the running width of each character to be photocomposed,

subjecting the characters to be photocomposed to classification into the aforesaid groups;

ascertaining, by reference to the group of the first character and the group of the second character of an adjacently positioned pair, the amount of running width adjustment to be provided; and

applying the adjustment to the running width of one of the adjacently positioned characters.

4,291,382

RELATIVE MANIFOLD VACUUM OF AN INTERNAL COMBUSTION ENGINE

Gary G. Full, Ellington, and Rinaldo R. Tedeschi, Newington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1979, Ser. No. 105,803

Int. Cl.[3] G01L *23/24;* **G06F** *15/20;* **G01M** *15/00*

U.S. Cl. 364—551 **7 Claims**

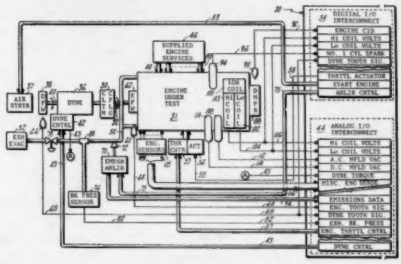
1. Apparatus for measuring the relative manifold vacuum contribution between cylinders of an internal combustion (IC)

engine connected through its crankshaft to the drive shaft of an engine load and running at a selected speed, comprising:

position sensing means, adapted to be disposed along the drive shaft for providing crankshaft position signals indicative of the instantaneous angular position of the engine crankshaft at successive angle intervals within the engine cycle, each angle interval being less than that associated with a cylinder sub-cycle;

manifold vacuum sensing means, adapted to be disposed on the engine for providing signals indicative of the actual engine manifold vacuum; and

signal processing means, responsive to said crankshaft posi-



tion signals and said actual engine manifold vacuum signals and having memory means for storing signals including signals definitive of the engine cycle,

for sampling and storing in said memory means, successive values of said actual manifold vacuum signals in response to the presense of each of said crankshaft position signals, to provide an indication of the sub-cyclic fluctuations in manifold vacuum over at least one engine cycle, and

for comparing the magnitudes of each of said sub-cyclic fluctuations occurring in a common engine cycle with each other to provide signal indications of the relative manifold vacuum contribution between cylinders.

4,291,383

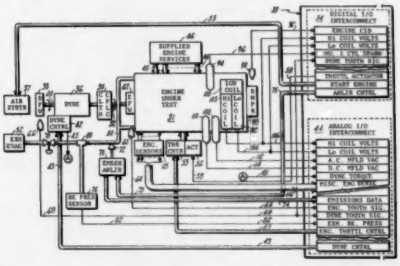
SPARK PLUG LOAD TESTING FOR AN INTERNAL COMBUSTION ENGINE

Rinaldo R. Tedeschi, Newington, and Gary G. Full, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1979, Ser. No. 105,680

Int. Cl.³ G01R *21/00*; G06F *15/20*; G01M *15/00*

U.S. Cl. 364—551 **5 Claims**



1. Apparatus for indicating the efficiency of the ignition system of an internal combustion (IC) engine connected at its crankshaft to the drive shaft of an engine load, the ignition circuitry providing secondary voltage signals as the spark plug voltage signal to each engine cylinder in each engine cycle, in the presence of associated ignition circuitry primary voltage signals, comprising:

first voltage sensing means for sensing the presence of each primary voltage signal and for providing a Lo-Coil voltage signal indicative thereof;

second voltage sensing means for sensing the actual magnitude of each secondary voltage signal and for providing a Hi-Coil voltage signal indicative thereof;

position sensing means, responsive to the interconnected engine crankshaft and load drive shaft, for providing engine crankshaft position signals indicative of the actual crankshaft angular position at successive crankshaft angle intervals in each engine cycle, said crankshaft angle intervals being less than that associated with a cylinder sub-cycle; and

signal processing means, responsive to said Lo-Coil voltage signals, said Hi-Coil voltage signals, and said crankshaft position signals, and having memory means for storing signals including specification signals defining the required crankshaft position of each cylinder spark plug voltage signal in each engine cycle in terms of actual crankshaft angle value,

for sampling, in response to each of said Lo-Coil voltage signals in a common engine cycle, and registering in said memory means, each of said Hi-Coil voltage signals and said crankshaft position signal appearing simultaneously therewith, and

for providing ratio signals of the actual magnitude of each of said Hi-Coil voltage signals sampled in a common engine cycle divided by the average value of all of said Hi-Coil voltage signals sampled in the same engine cycle, said ratio signals providing in combination an indication of the relative spark efficiency of the engine.

4,291,384

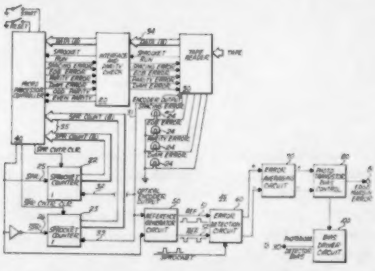
TAPE GAUGE SYSTEM

James M. Burton, Seattle; Robert L. Miller, Bothell, and Jansey D. Tieden, Puyallup, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 16, 1980, Ser. No. 150,512

Int. Cl.³ G06K *5/04*

U.S. Cl. 364—560 **3 Claims**



1. A system for dynamically testing the dimensional accuracy of punched tape comprising in combination:

a tape reader having a plurality of error condition lights;

said tape reader having an optical encoder output signal;

a first binary counter having a count directly proportional to sprocket hole diameter;

a second binary counter having a count directly proportional to space between holes;

said optical encoder output signal coupled to said first and second binary counters;

a microprocessor controller coupled to said first and second binary counters for examining the contents of said first and second binary counters and comparing the respective values obtained from said first and second binary counters with predetermined limits, said microprocessor controller further coupled to said tape reader for stopping said tape

reader and illuminating one of said plurality of error condition lights in the event of the detection of an out of tolerance condition; and,

an edge margin error detection circuit responsive to said optical encoder output signal for providing a signal at an output terminal representative of edge margin error.

4,291,385

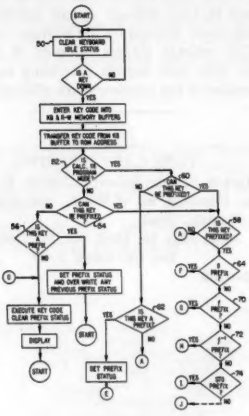
CALCULATOR HAVING MERGED KEY CODES

Thomas E. Osborne, San Francisco, and Richard K. Stockwell, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 425,341, Dec. 17, 1973, Pat. No. 4,099,246. This application Oct. 14, 1977, Ser. No. 842,134

Int. Cl.[3] **G06F** *3/02*

U.S. Cl. 364—709 **2 Claims**



1. A method for storing a sequence of instructions entered via a keyboard into a programmable electronic calculator, the method comprising the steps of electronically:

detecting the actuation of a key on the keyboard;

generating a key code representing the key actuated in response to the detection of the actuation;

deciding whether a status indicator has been set in a status register;

if no status indicator has been set, deciding whether the key code of the key actuated can be merged with a subsequently generated key code; if it can be merged, setting a status indicator and storing the key code; if it cannot be merged, storing the key code; and

if a status indicator has been set, deciding whether the key code of the key actuated can be merged with a previously generated and stored key code; if it can be merged, generating a merged key code representing both the previously generated and stored key code and the key code of the key actuated, erasing the status indicator and the previously generated and stored key code, and storing the merged key code; if it cannot be merged, storing the key code of the key actuated and erasing the status indicator.

4,291,386

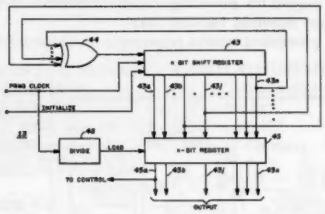
PSEUDORANDOM NUMBER GENERATOR

David S. Bass, Floral Park, N.Y., assignor to Sperry Corporation, New York, N.Y.

Division of Ser. No. 965,122, Nov. 30, 1978, Pat. No. 4,222,514. This application Feb. 4, 1980, Ser. No. 118,180

Int. Cl.[3] **H03B** *29/00*

U.S. Cl. 364—717 **1 Claim**



1. A pseudorandom number generator comprising:

shift register means having tap means at each stage thereof, data input means and clock input means;

K bit modulo two adder means coupled at input means thereof to K selected tap means of said shift register means and at output means thereof to said data input means of said shift register means;

register means with each stage thereof coupled correspondingly to said tap means of said shift register means, said register means having tap means at each stage thereof and clock input means; and

means coupled between said clock input means of said shift register means and said clock input means of said register means for providing a clock pulse to said clock input means after a preselected number of clock pulses have been applied to said clock input means of said shift register means whereby after each clock pulse applied to said register means a data code is available at said tap means of said register means.

4,291,387

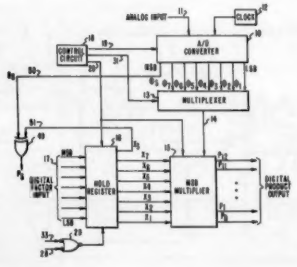
ANALOG TO DIGITAL CONVERSION WEIGHTING APPARATUS

James E. Buchanan, Bowie, Md., and Marshall L. Field, Jr., Cedar Rapids, Iowa, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1979, Ser. No. 17,664

Int. Cl.[3] **G06F** *7/52*

U.S. Cl. 364—757 **2 Claims**



1. In apparatus for converting an analog signal to a multi-bit digital word that is the product of the digital signal and a selected weighting factor, that includes:

an analog to digital converter operative to generate a plurality of information bits that corresponds to the input signal

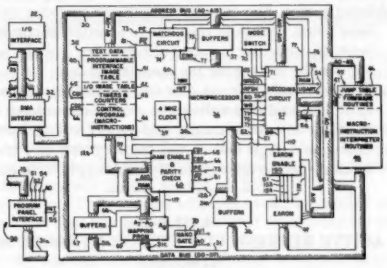
in sequence from the most significant to the least significant bit of a word, and a digital multiplier operative to sequentially process each of said bits in sequence from the most significant to the least significant bit of the word to generate a multi-bit word product wherein the improvement comprises:

control means including a multiplexer connecting the converter and multiplier operative to transfer from the converter to the multiplier each of the bits in succession to process in succession the most significant to the least significant bit prior to the completion of the conversion of the entire multi-bit digital word, and including a holding register operative to apply bits of a digital word to the multiplier to weight the converted bits.

4,291,388
PROGRAMMABLE CONTROLLER WITH DATA ARCHIVE

Donald R. Ecker, Jr., Euclid; Ernst Dummermuth, Chesterland, and Odo J. Struger, Chagrin Falls, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Dec. 20, 1978, Ser. No. 971,593
Int. Cl.³ G06F *11/16*
U.S. Cl. 364—900 **12 Claims**



1. An improved digital controller of the type having a random-access read/write memory which stores control data that is used in controlling a machine, wherein the improvement comprises:

an erasable, read-mostly memory, for nonvolatile storage of control data;

loading means coupled to both the read/write memory and the read-mostly memory for transferring control data from the read/write memory into the read-mostly memory to form a non-volatile master copy;

data-checking means coupled to the read/write memory for verifying the control data in the read/write memory; and

reloading means, coupled to both the read/write memory and the read-mostly memory and responsive to a failure of the data-checking means to verify the control data in the read/write memory, for transferring the master copy of control data from the read-mostly memory into the read/write memory.

4,291,389
MEMORY SYSTEM USING FAULTY BUBBLE MEMORY DEVICES

Dolan H. Toth, Circle Pines, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 20, 1979, Ser. No. 96,099
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **2 Claims**

1. A word organized, fault tolerant bubble memory system comprising:

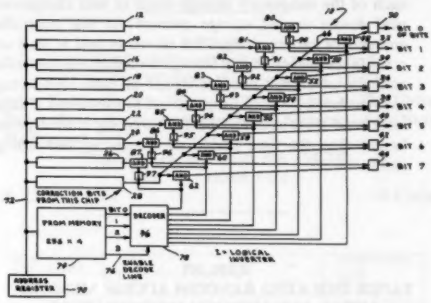
a plurality of bubble memory chips, each having the same number of minor loops as is required for a nominal memory size, equivalent in number to the word size of the memory system,

a correction bit bubble memory chip,

memory means responsive to input addresses for identifying defective bit locations in said plurality of bubble memory chips,

means for providing addresses to said memory means and to said memory system,

means for substituting, in reading and writing operations, correction bits from said correction bit bubble memory chip for bits in any one of said plurality of bubble memory chips in response to output signals from said memory means identifying a defective bit location, wherein said means for substituting is comprised of a decoder associated with an output address from said memory means for identifying a particular one of said plurality of bubble

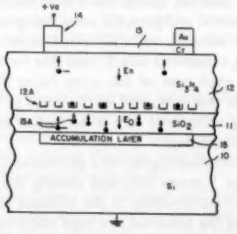


memory chips having a defective location and logic gate means which in response to a signal from said decoder connects said correction bit chip with the appropriate input or output of said memory system in reading and writing operations, said logic gate means being comprised of AND gates associated with each of said bubble memory chips, each of said AND gates receiving a common data bit input from said correction bit bubble memory chip and a unique input from said decoder for gating said input in response to an enable signal from said decoder together with AND gate means for disabling the output from any one of said bubble memory chips in response to an inverted enable signal from said decoder when a bit from said correction bit chip is to be gated.

4,291,390
ANALOG SOLID STATE MEMORY

Ernest R. Stern, Concord; Richard W. Ralston, Bedford; Daniel L. Smythe, Jr., Carlisle, and Barry E. Burke, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 28, 1979, Ser. No. 80,098
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—183 **26 Claims**



1. An analog signal storage device comprising

a plurality of storage elements, each comprising a semicon-

ductor substrate having at least two layers, at least one of said layers having a non-linear current vs. field conductivity characteristic and at least one other layer being capable of storing carrier charges therein;

a charge-coupled device having a plurality of storage wells, each associated with one of said plurality of storage elements;

means for applying an analog signal to said charge-coupled device so that a charge is temporarily stored in each of the storage wells thereof, the charge in each of said storage wells being proportional to the amplitude of a portion of said analog signal which is applied to said charge-doupled device;

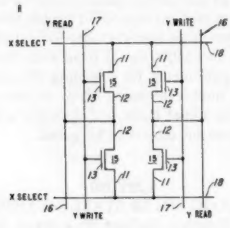
storage control means for transferring the stored charges in each of the temporary storage wells of said charge-coupled device to said storage elements so that controlled amounts of carrier charges are stored in said at least one other layer of each of said storage elements, the controlled amounts of carrier charges stored in each said storage element being linearly proportional to the stored charges associated therewith and being stored for a time period longer than the time period of storage in said storage wells.

4,291,391

TAPER ISOLATED RANDOM ACCESS MEMORY ARRAY AND METHOD OF OPERATING

Pallab K. Chatterjee, Dallas, Tex., and Geoffrey W. Taylor, Murray Hill, N.J., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 14, 1979, Ser. No. 75,574
Int. Cl.³ G11C *11/40, 7/00*
U.S. Cl. 365—184 **8 Claims**



1. A method of operating an X-Y array of semiconductor random access memory cells by writing information into, storing information in, and reading information out of a single cell in the array without disturbing the state of other cells in the array, wherein each memory cell has a single depletion mode, buried channel, metal-oxide-semiconductor transistor with a source, drain, and gate, the array being arranged in rows and columns of memory cells, all the drains in each column of the array being connected to a Y-read line for that column, all the sources in each row of the array being connected to an X-select line for that row, and all the gates in each column of the array being connected to a Y-write line for that column, said method comprising:

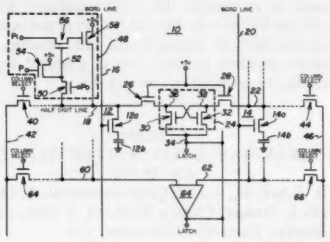
applying appropriate signals to a particular X-select line and a particular Y-write line, and sensing the signal on a Y-read line corresponding to the selected single cell while maintaining the potential at a high reference voltage magnitude V_{DD} on all other X-select lines and while maintaining the potential at an intermediate voltage magnitude V_{GG} less than V_{DD} but greater than a low reference voltage magnitude V_{SS} on all other Y-write lines.

4,291,392

TIMING OF ACTIVE PULLUP FOR DYNAMIC SEMICONDUCTOR MEMORY

Robert J. Proebsting, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Feb. 6, 1980, Ser. No. 119,292
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—203 **5 Claims**



1. A method for writing data into a memory cell of a dynamic semiconductor memory circuit comprising the steps of:

driving a digit line associated with the memory cell to at least a first voltage in response to an external command to write data into the memory cell, said first voltage less than the supply voltage for the memory circuit;

activating a pullup circuit after said digit line has been driven to at least said first voltage, to elevate the voltage on said digit line to approximately said supply voltage; and

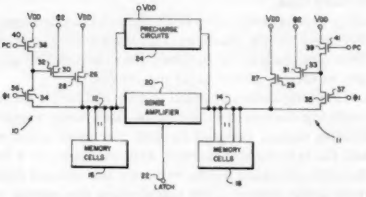
coupling said digit line to the memory cell to charge the memory cell to approximately said supply voltage.

4,291,393

ACTIVE REFRESH CIRCUIT FOR DYNAMIC MOS CIRCUITS

Dennis R. Wilson, Boise, Id., assignor to Mostek Corporation, Carrollton, Tex.

Filed Feb. 11, 1980, Ser. No. 120,268
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—203 **48 Claims**



1. Circuitry for selectively refreshing a capacitive node to a high logic state as a function of a preestablished voltage level on that node comprising:

a first transistor having a channel connected between a source of a drain supply voltage and said node, and a gate;

a second transistor having a source connected to said first transistor gate, a drain, and a gate;

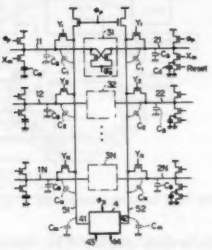
a third transistor having a source connected to said node, a drain connected to said second transistor gate, and a gate; and

control means for sequentially: precharging said second transistor gate to a first potential near said drain supply voltage; applying a reference potential to said third transistor gate, said reference potential being less than one threshold above a minimum voltage representing a high logic state; and, applying a second potential near said drain supply voltage to the drain of said second transistor.

4,291,394
SEMICONDUCTOR MEMORY DEVICE HAVING FLIP-FLOP CIRCUITS

Masao Nakano; Tomio Nakano; Yoshihiro Takemae, and Katsuhiko Kabashima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 22, 1979, Ser. No. 87,389
Claims priority, application Japan, Oct. 26, 1978, 53/132049
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—206 3 Claims



1. A semiconductor memory device having flip-flop circuits, comprising:

a first bit lines arranged on one side of the flip-flop circuits;

second bit lines arranged on the other side of said flip-flop circuits, the potential of the second bit lines being opposite to the potential of the first bit lines;

a first data bus line operatively connected to and crossing perpendicularly to said first bit lines;

a second data bus line operatively connected to and crossing perpendicularly to said second bit lines;

a first dummy line arranged adjacent to and in parallel with said first data bus line and connected to said second data bus line; and

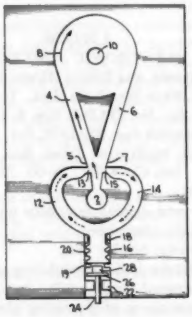
a second dummy line arranged adjacent to and in parallel with said second data bus line and connected to said first data bus line,

whereby noise generated by the coupling between said first and second bit lines and said first and second data bus lines is cancelled.

4,291,395
FLUID OSCILLATOR

Allen B. Holmes, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1979, Ser. No. 64,451
Int. Cl.[3] G01V *1/40*
U.S. Cl. 367—83 6 Claims



1. A pulsing device having an inlet and alternate paths for fluid flow and means for generating pulses in a fluid entering said inlet and flowing through said device, comprising fluid feedback oscillating means for directing the fluid flow from said inlet to said alternate paths, and vortex valve means in communication with said paths for alternately increasing and decreasing resistance to fluid flow received from said alternate paths by reversal of vortical flow to generate said pulses,

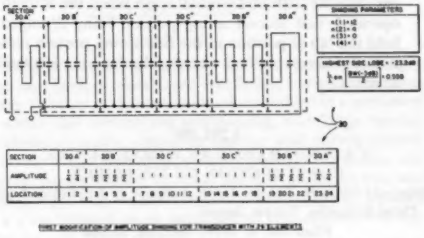
pulse regulating means for increasing the frequency of oscillation of said fluid feedback oscillating means above a threshold level precluding reversal of vortical flow for preventing generation of said pulses,

said pulse regulating means comprising means for regulating the frequency of oscillation of said fluid feedback oscillating means below said threshold level to control the rate at which said pulses are generated.

4,291,396
DISCRETE AMPLITUDE SHADING FOR LOBE-SUPPRESSION IN DISCRETE ARRAY

Gordon E. Martin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1980, Ser. No. 114,780
Int. Cl.[3] H04R *1/32*
U.S. Cl. 367—154 10 Claims



1. A transducer array, generally linear, of a plurality of discrete transducer elements, which are shaded discretely, the array comprising a plurality of parallel combinations of the transducer elements, one end of each combination being connected to a common connection, the other end of each combination being connected to another common connection, the parallel combinations being distributed, that is, positioned, symmetrically about the middle of the array, wherein:

the transducer elements of the two parallel combinations which are positioned at each end of the array are connected serially to each other.

4,291,397
MANUAL DATE ADVANCE MECHANISM FOR A WATCH

Paul Wuthrich, Watertown, and Frank Mascia, Bristol, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

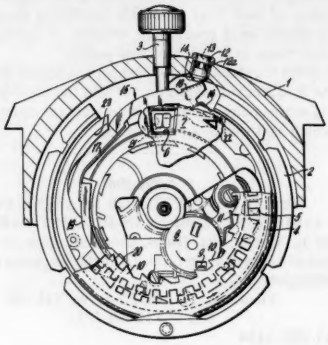
Filed Oct. 15, 1979, Ser. No. 85,168
Int. Cl.[3] G04B *19/24*
U.S. Cl. 368—35 4 Claims

1. In a calendar watch of the type having a frame, a date ring with internal teeth rotatably mounted in said frame, means for periodically rotatably advancing said date ring, and spring detent means for holding the date ring in position when advanced, the improvement comprising:

a manual actuator disposed adjacent said frame and having a portion movable with respect to the frame, and

a date change lever pivotably mounted on the frame, said lever including integral therewith: a first integral spring portion having a first contact area cooperating with said frame and biasing the lever to a rest position, a second contact area defined by said lever disposed to cooperate

with the movable portion of said actuator to cause said lever to pivot, an integral arm having a tab portion adapted to cooperate with said date ring internal teeth when the lever is pivoted toward an operating position, and a second integral spring portion adapted to flex when said integral arm and tab are pivoted toward an operating



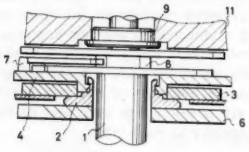
position, said lever being arranged to move said tab into engagement with said internal teeth when the actuator is operated, said second spring portion being arranged to hold the tab in position as the first spring portion returns the lever to rest position whereby the date ring is rotatably advanced.

4,291,398

CALENDAR DISPLAY WHEEL GUARD CONSTRUCTION OF TIMEPIECE

Shigeyuki Masuda, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jul. 6, 1979, Ser. No. 55,280
Claims priority, application Japan, Jul. 25, 1978, 53-90833
Int. Cl.³ G04B *19/24, 19/04*
U.S. Cl. 368—37 **5 Claims**



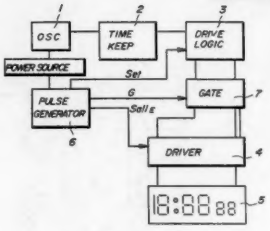
1. In a calendar timepiece: a dial plate; a calendar display wheel; a back plate, wherein said dial plate, said calendar display wheel and said back plate each have a central opening therethrough and are positioned facing each other in the named order with their central openings aligned; and calendar display wheel guard means mounted on said back plate for rotatably mounting said calendar display wheel and for spacing said dial plate from said calendar display wheel, wherein said calendar display wheel guard means has a bore extending therethrough aligned with the respective central openings of said dial plate, said calendar display wheel, and said back plate, said calendar display wheel guard means has a first end face surrounding the opening of the bore at a first end of said calendar display wheel guard means, said first end face of said display wheel guard means abutting said dial plate for maintaining said dial plate spaced from said calendar display wheel, and no portion of said calendar display wheel guard means extends into the central opening through said dial plate.

4,291,399

INITIAL BLEACH IN AN ELECTROCHROMIC DISPLAY

Shigeki Imai, Tenri, and Hiroaki Fukuda, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1979, Ser. No. 52,219
Claims priority, application Japan, Jun. 28, 1979, 53/79371
Int. Cl.³ G09F *9/00;* **G04C** *19/00*
U.S. Cl. 368—82 **11 Claims**



1. An electrochromic display drive system comprising:
an electrochromic display device having at least two segment electrodes;
driver circuit means for developing a coloration signal and a bleaching signal for coloring and bleaching, respectively, one of said at least two segment electrodes of the electrochromic display device;
selection circuit means for selecting at least one of said segment electrodes for coloring or bleaching by said driver circuit means;
a power supply source for activating said selection circuit means and said driver circuit means; and
an initial condition stabilizing means, including
a detection means for developing a detection output when the supply of power from said power supply source is initiated, said detection output energizing said selection circuit means, the operative condition of said selection circuit means remaining fixed in response to said detection output, said detection means including a differentation circuit connected to said power supply source and devloping a differentiated output signal, and
a monomultivibrator for developing said detection output of a predetermined time length in response to said differentiated output signal from said differentiation circuit;
a bleaching signal developing means for bleaching the display on said electrochromic display device in response to said detection output derived from the detection means while the operative condition of said selection circuit means remains fixed.

4,291,400

ELECTRONIC TIMEPIECE

Katsuhiko Komiyama, and Toshio Hiruta, both of Tokyo, Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

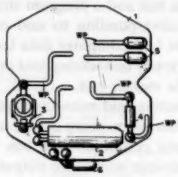
Continuation of Ser. No. 831,509, Sep. 8, 1977, abandoned. This application Jan. 25, 1979, Ser. No. 6,364
Claims priority, application Japan, Sep. 14, 1976, 51-119494
Int. Cl.³ G04C *19/00, 23/02*
U.S. Cl. 368—84 **11 Claims**

1. A liquid crystal display timepiece module including electronic components comprising:
(a) a liquid crystal display cell;
(b) a support frame made of insulating plastic and supporting said liquid crystal display cell;
(c) a protective cover of insulating plastic adjacent to said support frame;
(d) a circuit substrate disposed between said liquid crystal display cell and said protective cover, said circuit sub-

strate including a wiring pattern mounted on one surface thereof and connected to said electronic components;

(e) a plurality of electrode terminals formed on the under surface of said circuit substrate and electrically connected to said wiring pattern;

(f) a plurality of contact switches operable by an external control member being fixed on one surface of said protective cover between said protective cover and said circuit substrate, each of said contact switches including a terminal portion ending at an outer periphery of said protective cover;



(g) a resilient contact formed to each of said contact switches, said resilient contact mounted on said protective cover in electrical contact with said electrode terminals; and

(h) joining means for joining said liquid crystal display cell, said support frame, said circuit substrate and said protective cover to form the module.

4,291,401

DEVICE FOR SECURING A WATCH DIAL TO A WATCH-MOVEMENT PLATE

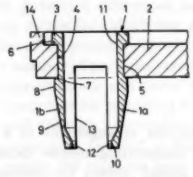
Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Bettlach, Switzerland

Filed Nov. 21, 1979, Ser. No. 96,394

Claims priority, application Switzerland, Nov. 30, 1978, 12276/78

Int. Cl.³ G04B *19/06*

U.S. Cl. 368—236 **4 Claims**



1. A device for securing a watch dial having two or more integral dial-feet to a watch-movement plate including opposing substantially planar faces and a like number of holes for receiving said dial-feet, of the type having a sleeve inserted through each of said holes, each said sleeve including a first portion sunk in said plate and a second portion projecting from the face of said plate intended to be situated remote from said dial, said second portion being formed of a plurality of claws separated from one or more slots, wherein the improvement comprises:

said sleeves are made of substantially non-deformable metal,

a cylindrical bearing segment included in each said first portion and situated within the associated one of said holes,

two radially outwardly extending substantially non-deformable shoulders, preformed before insertion of the sleeve into the respective hole, bounding said bearing segment and each having a planar face which abuts a respective substantially planar face of said plate, the exterior of said second portion being frustoconical in shape, the diameter of the smaller base thereof, most remote from said plate, being less than the diameter of said holes,

said one or more slots extending from the end of said second portion remote from said plate to within said bearing segment, and

said one or more slots being of sufficient length and width to permit said claws to bend resiliently toward the interior of said sleeve, thereby allowing the one of said non-deformable shoulders nearest said second portion to enter the associated one of said holes during insertion of said sleeve.

4,291,402

PLASTIC WATCH CASE

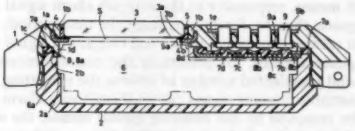
Koichi Nakajima, and Hidetaka Tsuchiya, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 141,976

Claims priority, application Japan, May 25, 1979, 54-69586[U]

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—276 **6 Claims**



1. A glass mounting structure for watches comprising a watch case made of plastic, said watch case having an opening, a flange member made of metal plate embedded in a portion of said watch case surrounding said opening, said flange member comprising an axially extending annular wall portion embedded in said watch case along an inside wall of said opening and an inside flange portion which is laterally projected into said opening, a packing engaged in the inside wall of said opening and a glass engaged on an inner side of said packing and supported by said flange portion.

4,291,403

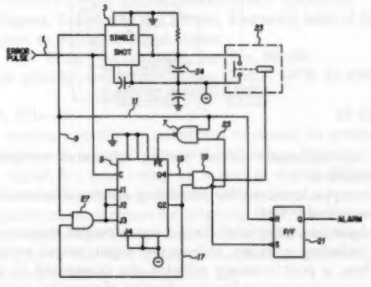
DIGITAL IMPLEMENTATION OF PARITY MONITOR AND ALARM

John W. Waddill, Plano, and Bahram Pourmand, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 22, 1979, Ser. No. 41,452

Int. Cl.³ G06F *11/30*; H04B *17/00*

U.S. Cl. 371—5 **2 Claims**



1. An error monitor and alarm generator for providing an alarm signal when an error rate exceeds a first established threshold and for maintaining the alarm signal for as long as the error rate exceeds a second established threshold, the error rate being indicated by the accumulation of an error count,

during a fixed period of time, of error pulses generated by an error code checker that checks periodically placed error codes on a digital data stream, the error monitor and alarm generator, comprises:

single shot multivibrator means for generating a time period, and for providing an enabling signal during the time period, the single shot multivibrator being triggered by the occurrence of a first error pulse;

presettable counter means for accumulating the error count which is updated at the occurrence of each error pulse;

detector circuit means for detecting when the error count accumulated by the presettable counter means exceeds a first preselected number of counts, and for providing an activate alarm signal at the detection of the error count exceeding the first preselected number of counts, the first preselected number of counts being related to the first established threshold in that when the first selected number of counts is accumulated during the time period the first established threshold has been exceeded;

flip-flop means for providing an alarm signal in response to the activate alarm signal, and for maintaining the alarm signal until the enabling signal is removed by the single shot multivibrator means;

switch means, responsive to the activate alarm signal and in response thereto, for reinitializing the time period;

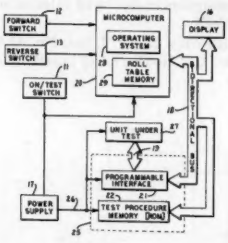
circuit means, responsive to the activate alarm signal and in response thereto, for presetting the counter means to a second preselected number of counts, the presetting of the presettable counter means causes the activate alarm signal to be removed by the detector circuit means, the second established threshold being related to a difference between being the first preselected number of counts and the second preselected number of counts in that when the difference is accumulated during the reinitialized time period, the second established threshold has been exceeded.

4,291,404

AUTOMATIC CIRCUIT TESTER WITH IMPROVED VOLTAGE REGULATOR

William G. Steiner, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Nov. 20, 1979, Ser. No. 96,030
Int. Cl.[3] G06F *11/22*
U.S. Cl. 371—20 **3 Claims**



1. An automatic circuit testing apparatus comprising in combination:

a receptacle means for providing electrical contact with a unit under test;

at least one integrated circuit input/output memory device including memory, at least one input/output port, a data bus, a port/memory selector pin connected to a signal source corresponding to selection of memory, a read input responsive to an active state thereon to read onto said data bus data from said memory when said port/memory selector pin is in a first state and to read onto said data bus data from said input/output port when said port/memory selector pin is in a second state, a port read input responsive to an active state thereon to cause data present at said input/output port to be provided onto said data bus and a port write input responsive to an active state thereon to write data present on said data bus to said input/output port;

a microcomputer including a microcomputer data bus, a write output for providing an active output state in response to said microcomputer executing an instruction to write data present on said computer data bus to an external device, a read output having an active state corresponding to said microcomputer accepting data from said computer data bus and a program store output having an active state corresponding to said computer seeking to accept data on said computer data bus as an instruction;

means for electrically connecting said input/output port and said receptacle means; and

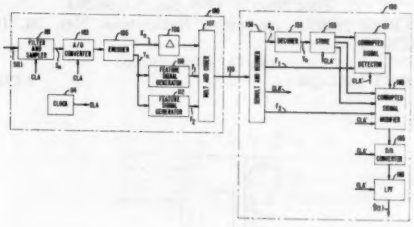
means for connecting said microcomputer to said integrated circuit input/output memory device including a means for connecting said computer data bus to said data bus, a connection between said write output and said port write input, a connection between said read output and said port read input, and a connection between said program store output and said read input.

4,291,405

ERROR REDUCTION SPEECH COMMUNICATION SYSTEM

Nuggehally S. Jayant, Short Hills; Carolyn E. Schmidt, Gillette, and Raymond Steele, Hazlet, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 7, 1979, Ser. No. 73,207
Int. Cl.[3] G06F *11/00*; G08C *25/00*
U.S. Cl. 371—31 **34 Claims**



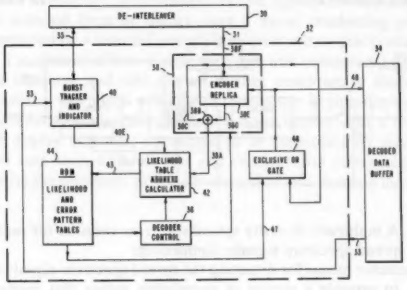
1. An error reduction arrangement in a communication system comprising transmitting means including means for receiving an input signal, means for converting said input signal into blocks of coded signals, and means for applying said blocks of coded signals to a transmission medium; and receiving means for converting the coded signal blocks from said transmission medium into a replica of said input signal;

CHARACTERIZED IN THAT said transmitting means (**180**) further comprises feature signal generating means (**110,112**) responsive to said blocks of coded signals for generating a signal representative of a first set of features of the waveform of said input signal and a signal corresponding to a second set of features of the waveform of said input signal; and said receiving means (**190**) further comprises means (**153, 157**) jointly responsive to the received first waveform feature signal and the received block coded signals for detecting corrupted received coded signals; and means (**160**) operative upon detection of each received corrupted coded signal jointly responsive to said received second waveform feature signal and the received block coded signals for modifying the value of said corrupted coded signal to reduce errors in said signal replica.

4,291,406
ERROR CORRECTION ON BURST CHANNELS BY SEQUENTIAL DECODING

Lalit R. Bahl, Amawalk; John Cocke, Bedford; Clifton D. Cullum, Jr., Putnam Valley, all of N.Y., and Joachim Hagenauer, Seefeld, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1979, Ser. No. 64,223
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—44 **13 Claims**



1. A sequential decoder and system for determining error patterns for making error correction on burst and random noise channels using convolutionally encoded data comprising:

de-interleaver means for time-demultiplexing the convolutionally encoded data from a data channel into a predetermined transformed order;

a decoded data buffer for storing received data which has been decoded by said de-interleaver;

a syndrome bit generator connected to the output of said de-interleaver means for calculating a syndrome bit from a combination of the presently received subblock together with a given number of previous sub-blocks received from said de-interleaver means and stored in said decoded data buffer, said syndrome bit indicating if the current assumption of the path through a convolutional tree is correct;

burst tracking means, connected to the output of said de-interleaver means, for tracking burst errors and deriving burst indicator bits which indicate the presence of burst errors in a channel, said burst tracking means also being connected to said decoded data buffer which stores previously decoded received data;

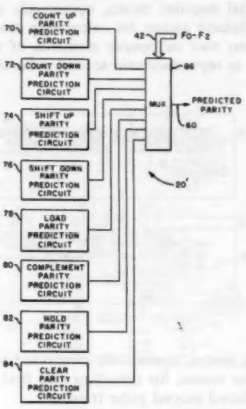
memory means for storing tables of error likelihood and error pattern values derived from known error statistics about the data channel, statistics of probability of random errors and burst errors, error severity within a burst, and average burst duration, said memory means being connected to and addressed by a calculating means for providing error likelihood and error pattern values to said decoded data buffer; and

said calculating means connected to both said syndrome bit generator and said burst tracking means for using said syndrome bits and said burst indicator bits to calculate a table address in said tables of error likelihood and error pattern values, said table address providing a likelihood value and an error pattern which are used to update a total likelihood value and determine an error pattern which are used to change received subblock data.

4,291,407
PARITY PREDICTION CIRCUITRY FOR A MULTIFUNCTION REGISTER

Rolfe D. Armstrong, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 10, 1979, Ser. No. 74,036
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **11 Claims**



1. In a data processing system, the combination of:

a register for storing data and operating on the data in accordance with any one of a plurality of predetermined functions, said register having control input means for receiving control signals and in response selecting one of the functions; and

parity prediction circuitry connected to said register for predicting the parity of the data stored in said register, said parity prediction circuitry comprising:

a plurality of circuit means, with one of said circuit means associated with each function for predicting the parity of the data when said register operates on the data in accordance with that function; and

selecting means connected for receiving the control signals received at said control input means of said register and in response selecting the one of said circuit means associated with the function selected by said control input means to provide its predicted parity.

4,291,408
SYSTEM FOR MONITORING BIT ERRORS

Kazuo Ogawa, Tokyo, and Eiji Suzuki, Kawasaki, both of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 30, 1979, Ser. No. 98,988
Claims priority, application Japan, Dec. 5, 1978, 53-149678
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **13 Claims**

1. A system, operatively connected to means for generating a first pulse train having "1" pulses, and means for receiving a carrier signal, for monitoring bit errors in digital differential phase modulation communications, comprising:

first parity counter means for counting the "1" pulses among n successive bits at intervals of n bits, where n is a positive integer, in the first pulse train, and for providing the counted result as a first parity bit;

inserting means, operatively connected to said first parity counter means, for inserting said first parity bit into the first pulse train, the first pulse train and said first parity bit being converted into a second pulse train;

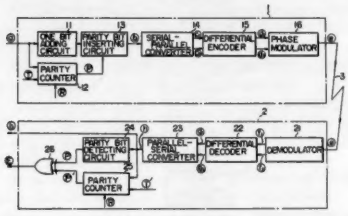
differential encoder means, operatively connected to said inserting means, for calculating modulo 2 sums of two

successive elements of said second pulse train to provide a calculation signal;

phase modulator means, operatively connected to said differential encoder means, for modulating the carrier signal with said calculation signal and for transmitting a modulated signal;

demodulator means, operatively connected to said phase modulator means, for demodulating said modulated signal to provide a demodulated signal;

differential decoder means, operatively connected to said demodulator means, for calculating modulo 2 differences between two successive elements of said demodulated signal to reproduce said second pulse train;



detecting means, operatively connected to said differential decoder means, for detecting said first parity bit in said reproduced second pulse train;

second parity counter means, operatively connected to said differential decoder means, for counting "1" pulses among n successive bits at intervals of n bits in said reproduced second pulse train except for said first parity bit and for producing the counted result as a second parity bit; and

comparing means, operatively connected to said second parity counter means and said detecting means, for comparing said first parity bit with said second parity bit, and for generating an error signal when said first and second parity bits are different from each other, said error signal indicating the generation of bit errors.

4,291,409

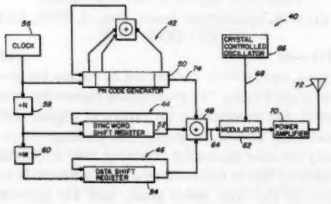
SPREAD SPECTRUM COMMUNICATIONS METHOD AND APPARATUS

Aaron Weinberg; Paul M. Ebert, both of Potomac; Joseph J. Fee, Wheaton, all of Md.; Yaroslav Kaminsky, Herndon, Va.; Feisal S. Keblawi, Vienna, Va., and Walter C. Scales, McLean, Va., assignors to The Mitre Corporation, Bedford, Mass.

Continuation of Ser. No. 917,290, Jun. 20, 1978, abandoned. This application Jul. 18, 1978, Ser. No. 925,847

Int. Cl.[3] H04B *15/00;* **H04K** *1/04*

U.S. Cl. 375—1 **23 Claims**



6. In a spread spectrum system having a carrier signal angle modulated by a message to be transmitted, and wherein the transmitted message comprises plural message bits synchronously combined with a repeating pseudorandom code sequence, a receiving method comprising the steps of

non-coherently acquiring and tracking said pseudorandom code sequence by employing non-coherent, recursive integration, and

thereafter acquiring and tracking the transmitted carrier frequency and phase.

4,291,410

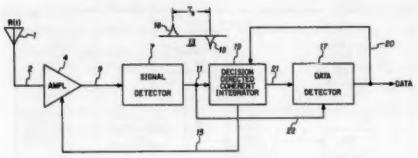
MULTIPATH DIVERSITY SPREAD SPECTRUM RECEIVER

Edgar L. Caples, Garland; Robert K. Marston, Plano, and Khalil E. Massad, Richardson, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 24, 1979, Ser. No. 87,910

Int. Cl.[3] H04B *1/12;* **H04J** *13/00*

U.S. Cl. 375—1 **13 Claims**



1. A multipath diversity spread spectrum receiver for receiving spread spectrum signals, comprising:

detector means for detecting the spread spectrum signals and to provide a stream of correlation pulses that relate to transmitted data;

integrator means for decision directed coherent integrating the stream of correlation pulses including:

normalizer means for normalizing the stream of correlation pulses to obtain a stream of normalized pulses,

first summing means for summing each member of the stream of normalized pulses with a corresponding member of a stream of output pulses to obtain a stream of combination pulses,

delay register means for delaying each member of the stream of combination pulses one symbol period to obtain the stream of output pulses, and

feedback path means for connecting the stream of output pulses to the summing means; and

first data detector means for decoding the transmitted data from the stream of output pulses to obtain a stream of detected data symbols.

4,291,411

REMOTE CONTROL FOR RADIOTELEPHONES

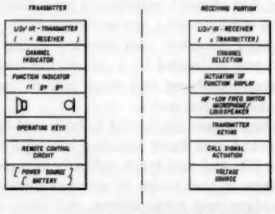
Horst Müller, and Helmut Vorwerk, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1979, Ser. No. 35,466

Claims priority, application Fed. Rep. of Germany, May 3, 1978, 2819386

Int. Cl.[3] H04B *1/40, 9/00, 11/00*

U.S. Cl. 455—88 **11 Claims**



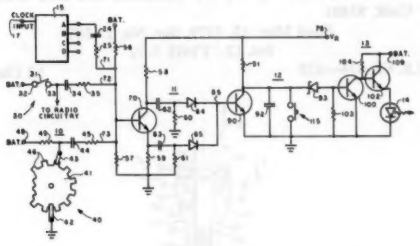
1. In a radiotelephone system having a radio frequency

transmitting/receiving device, a low frequency and control signal transmitting/receiving unit remote from the device, and means connected between the device and the unit for conducting therebetween system operation function control signals, constituted by a form of energy selected from among ultrasonic energy and infrared energy, the improvement wherein said means comprise: a first transmitter and receiver connected in said unit for transmitting and receiving said signals constituted by said selected form of energy; a second transmitter and receiver connected to said device for transmitting and receiving said signals constituted by said selected form of energy; each transmitter and receiver including means for coupling said first and second transmitter and receivers together to permit conduction therebetween of said signals constituted by said selected form of energy over a signal conducting path constituted by a selected one of an air path and a cable containing a maximum of four conductors; said unit comprises a function indicator and said device further comprises a channel selector, a call signal actuator, a transmitter keying device, a microphone/loudspeaker switch, a noise barrier, and a function display actuator, connected to be controlled by signals from said second transmitter and receiver and connected to control the operation of said device and of said function indicator.

4,291,412
PORTABLE RADIO FREQUENCY/CHANNEL DISPLAY SYSTEM

Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Jun. 25, 1980, Ser. No. 162,761
Int. Cl.[3] H04B 1/16
U.S. Cl. 455—154 **5 Claims**

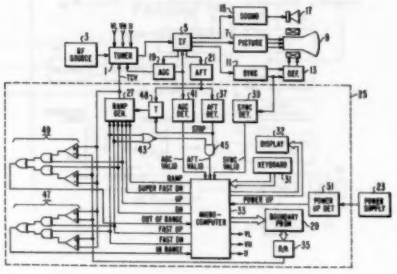


1. In a portable radio device of the type which is powered by a battery or other depletable power source, and which includes a plurality of controls for operating a corresponding plurality of radio functions and a display for indicating the frequency or channel to which the radio is tuned, a display control system comprising: sensing means coupled to said controls for generating an initiation signal in response to the operation of any of said functions by said controls; detecting means coupled to said sensing means and responsive to said initiation signal for developing a control signal in response to the generation of said initiation signal; signal lengthening means coupled to said detector means and responsive to said control signal for effectively lengthening the duration of said control signal for a predetermined amount of time; and switch means coupled between said display and said battery and responsive to said lengthened control signal for causing said display to be energized by said battery for said predetermined amount of time, whereby the display is energized whenever a control is operated and is automatically de-energized after the passage of a predetermined amount of time to thus conserve the battery.

4,291,413
SEARCH TYPE TUNING SYSTEM WITH DIRECT ADDRESS CHANNEL SELECTION APPARATUS

John G. N. Henderson, Princeton, and Robert J. Maturo, Bricktown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1979, Ser. No. 80,105
Int. Cl.[3] H03J 7/22
U.S. Cl. 455—164 **6 Claims**



1. In a receiver including tuning means for selectively tuning the RF carriers associated with respective channels in response to the magnitude of a tuning control signal and deriving from a selected one of said RF carriers an IF signal having at least one information bearing carrier, apparatus comprising:

channel selection means for generating binary signals representing the channel number of a selected channel;

memory means having a plurality of memory locationns for storing binary signals representing lower and upper boundaries of the tuning control signal for each of said channels;

control means responsive to said binary signals representing the channel number of said selected channel for selectively addressing the memory locations associated with at least one of the lower or upper boundaries for said selected channel when a new channel is selected;

generator means for generating said tuning control signal and cooperating with at least said control means and said memory means for selectively causing its magnitude to increase or decrease in ramp-like fashion from a magnitude substantially equal to a first boundary for said selected channel;

comparison means for comparing the boundary associated with an addressed one of said memory locations and the magnitude of said tuning control signal; and

detector means for determining when said IF signal has predetermined conditions when enabled in response to one of said control means and said comparison means when the magnitude of said tuning control signal substantially equals said first boundary for said selected channel;

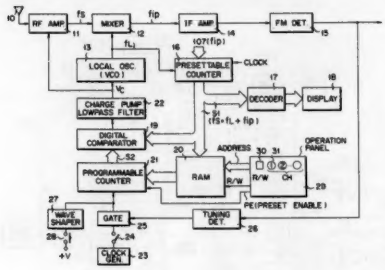
said generator means being enabled in response to said detector means to cause the magnitude of said tuning control signal to remain substantially constant after said IF signal has said predetermined conditions;

said generator means being enabled in response to said comparison means to cause the magnitude of said tuning control signal to stop changing in said selected sense when the magnitude of said tuning control signal corresponds to the second boundary for the selected channel in a predetermined manner.

4,291,414
RADIO RECEIVER OPERABLE IN STATION SEARCH MODE OR STATION SELECT MODE

Shigenobu Kimura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 30, 1980, Ser. No. 145,349
Claims priority, application Japan, May 2, 1979, 54-54509; May 2, 1979, 54-54510
Int. Cl.[3] H03J 7/26
U.S. Cl. 455—164 6 Claims



1. A radio receiver comprising:

local oscillator means for producing a local frequency signal;

mixer means for producing an intermediate frequency signal by mixing said local frequency signal from said local oscillator means with a broadcast signal received by said receiver;

detector means coupled to said mixer means for demodulating said intermediate frequency signal;

computing means connected to receive said local frequency signal for computing an algebraic sum of a number corresponding to the local frequency of said local oscillator means and a fixed number corresponding to the intermediate frequency, said algebraic sum representing tuned frequency information of said receiver;

counter means for counting clock pulses within a range between numbers corresponding to upper and lower limits of a receiving frequency band of said receiver, a count of said counter means representing broadcast frequency information to be received by said receiver;

comparing means for comparing the count of said counter means with output information from said computing means;

means coupled to said comparing means for controlling the oscillating frequency of said local oscillator means in response to said comparing means by shifting the oscillating frequency of said local oscillator means when said tuned frequency information from said computing means is not coincident with said broadcast frequency information from said counter means, and fixing the oscillating frequency of said local oscillator means when said tuned frequency information from said computing means is coincident with said broadcast frequency information from said counter means;

clock pulse generating means for supplying said clock pulses to said counter means so as to shift said broadcast frequency information from said counter means;

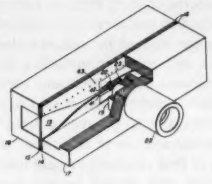
tuning detecting means coupled with said detector means for detecting that said receiver is tuned to the broadcast signal; and

means responsive to said tuning detecting means to disable said counter means from counting said clock pulses from said clock pulse generating means when said receiver is tuned to the broadcast signal.

4,291,415
MICROWAVE INTEGRATED CIRCUIT DOUBLE BALANCED MIXER

Charles D. Buntschuh, Bedford, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed Dec. 3, 1979, Ser. No. 99,858
Int. Cl.[3] H04B 1/26; H03H 7/42
U.S. Cl. 455—328 10 Claims

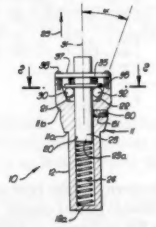


1. A double-balanced mixer of the star-configuration type for microwave-frequency electromagnetic waves comprising, a sheet of dielectric substrate, two electrical conductors on each side of said substrate forming a balanced four-wire line in a substantially rectangular configuration, first terminal means coupled to said line in a parallel mode, second terminal means coupled to said line in a transverse-mode, a common star-configuration point electrically available from both sides of said substrate in the vicinity of said four-wire line, four non-linear devices connected two in series defining an intermediate terminal therebetween and with the two connected between the two conductors on each side of said substrate and having their respective intermediate terminals connected to said common point, a common reference terminal for said four-wire line, and third terminal means connected between said common point and said common reference terminal.

4,291,416
CHAIN TENSIONER

Herbert W. Hoeptner, III, 273 Hermosa, San Luis Obispo, Calif. 93401

Filed Mar. 12, 1979, Ser. No. 19,557
Int. Cl.[3] F16H 7/12
U.S. Cl. 474—138 12 Claims



1. A tensioning device for tensioning a chain, comprising

(a) an axially elongated body means having a stem portion with a bore therein,

(b) a plunger carried by the body means and movable axially relative thereto in the bore, and a first compression spring in the bore urging the plunger axially in a first direction to exert biasing force operable to tension said chain,

(c) the body means having an interior ramp surface facing the plunger, the ramp tapering inwardly in a second direction which extends generally opposite said first direction,

(d) wedgable means located between the ramp surface and the plunger, and urging means urging the wedgable means into wedging engagement with the ramp surface and the plunger whereby the plunger may be displaced by the first spring in said one direction but is blocked against displacement in said opposite direction,

(e) and a holder defining a socket receiving said stem portion for locating said stem portion so that said plunger is urged in a chain tensioning direction by said first spring.

DESIGN PATENTS

GRANTED SEP. 22, 1981

ERRATA

For CLASS	See PATENT NO.
D32–040	260,845
D32–022	260,900
D32–032	260,901

DESIGNS

SEPTEMBER 22, 1981

260,820

PINBALL GAME HOUSING FOR PRE-SCHOOL AGE CHILDREN

Yuji Kato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

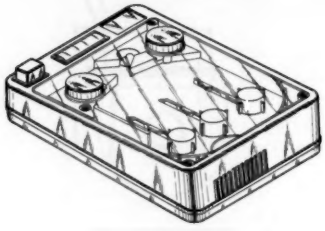
Filed Aug. 20, 1979, Ser. No. 67,825

Claims priority, application Japan, May 23, 1979, 54-20898

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D2—7



260,821

LUGGAGE BAG

Louis Schneider, Landsham, and Hans A. Muth, Hechendorf, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1979, Ser. No. 20,321

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 11455

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D3—71

260,822

COMBINED HAIR BRUSH AND HAND SHIELD THEREFOR

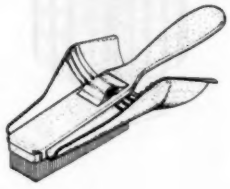
Giuseppe Sapronetti, 12731 Victory Blvd., North Hollywood, Calif. 91606

Filed Dec. 10, 1979, Ser. No. 101,902

Term of patent 14 years

Int. Cl. D4—*02;* D28—*03*

U.S. Cl. D4—35



260,823

GAME CHAIR

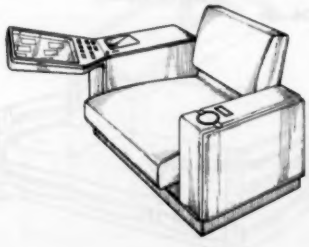
Edward L. Stulik, Jr., Calabasas, Calif., assignor to Michael Wichinsky, Las Vegas, Nev.

Filed Jun. 30, 1978, Ser. No. 920,853

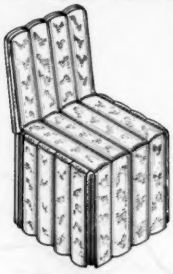
Term of patent 14 years

Int. Cl. D6—*05*

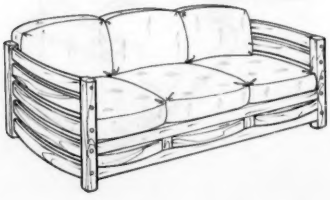
U.S. Cl. D6—42



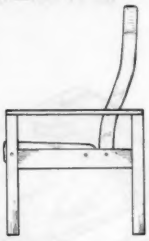
260,824
CHAIR COVER
Bernard Nusinow, 1110 Lake Shore Dr., Chicago, Ill. 60611
Filed Nov. 13, 1978, Ser. No. 959,661
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—48



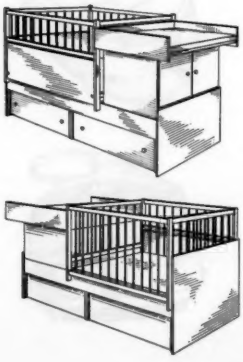
260,825
SOFA
Jobie G. Redmond, High Point, N.C., assignor to Jack Daniel Distillery, Lem Motlow, Prop., Inc., Lynchburg, Tenn.
Filed Nov. 8, 1978, Ser. No. 958,846
The portion of the term of this patent subsequent to Jul. 14, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60



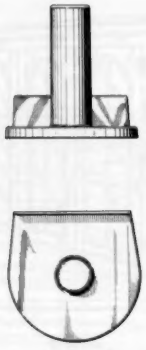
260,826
ARM CHAIR
Ned Steinberger, York, Pa., assignor to Thonet Industries, Inc., York, Pa.
Filed Dec. 7, 1978, Ser. No. 967,312
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73



260,827
COMBINED CRIB, DRESSING TABLE AND STORAGE UNIT
Peter A. Sommer, 2911 Bayview Ave., Suite 112-D, Willowdale, Ontario, Canada (M2K 1E8)
Filed Nov. 13, 1978, Ser. No. 959,543
Claims priority, application Canada, Jul. 25, 1978, 25077810
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—80

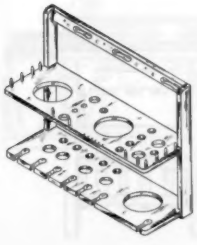


260,828
TOILET TISSUE HOLDER
Paul Cordray, Ocie, Mo. 65719, and Migdonio Seidler, 1108 S. College, Pittsburg, Kans. 66762
Filed May 7, 1979, Ser. No. 36,867
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

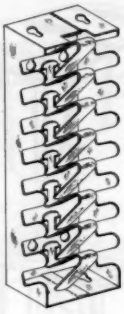


260,829
KEY RACK OR THE LIKE
Joan K. Creamer, East Greenwich, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 21, 1980, Ser. No. 143,062
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—114

260,830
SPORTS EQUIPMENT STORAGE RACK
E. Donald Trouba, 413 Winterburn, Elkhorn, Nebr. 68022
Filed Jul. 18, 1980, Ser. No. 170,205
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125

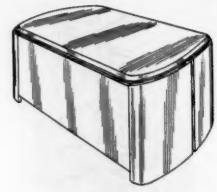


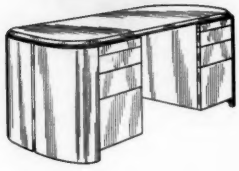
260,831
TOOL HOLDER
John E. Hotchkiss, 451 Cedar Hill Dr., San Rafael, Calif. 94903
Filed Jun. 2, 1980, Ser. No. 155,100
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—130



260,832
TRAY
Sandra R. Verdesca, and Joseph T. Verdesca, both of Dallas, Tex., assignors to Computer Roomers, Dallas, Tex.
Continuation-in-part of Ser. No. 732,453, Oct. 14, 1976, Pat. No. Des. 250,380. This application Jul. 21, 1978, Ser. No. 926,714
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—132

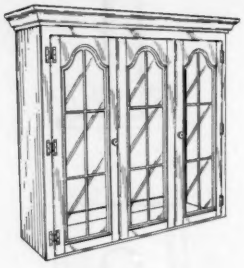
260,833
DESK OR SIMILAR ARTICLE
Lydia de Polo, and Jack G. Dunbar, both of New York, N.Y., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Jun. 4, 1979, Ser. No. 45,156
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—161



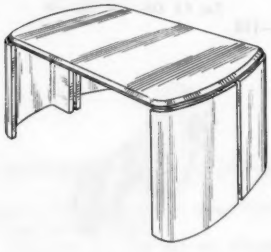


260,834
DESK
Warren Platner, Guilford, Conn., assignor to Litton Business Systems, Inc., Burlington, Iowa
Filed Jun. 9, 1978, Ser. No. 914,285
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

260,835
HUTCH
Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Filed Oct. 12, 1978, Ser. No. 950,707
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—172

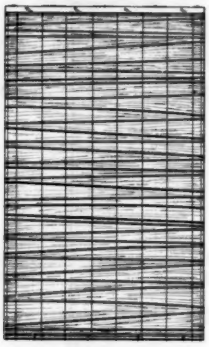


260,836
TABLE OR SIMILAR ARTICLE
Lydia de Polo, and Jack G. Dunbar, both of New York, N.Y., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Jun. 4, 1979, Ser. No. 45,155
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—177

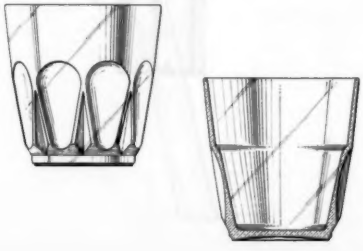


260,837
SERVING TABLE
Philip L. Tome, Malta, Ohio, assignor to Taylor Woodcraft, Malta, Ohio
Filed May 23, 1979, Ser. No. 41,930
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

260,838
BLIND
Seiichi Kato, 356, Tsuchihara 4-chome, Tenpaku-ku, Nagoya City, Aichi, Japan
Filed May 4, 1979, Ser. No. 36,019
Term of patent 14 years
Int. Cl. D6—*10*
U.S. Cl. D6—205

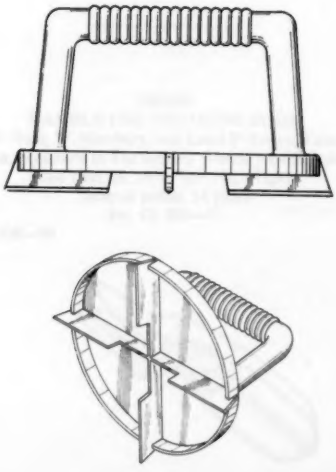


260,839
TUMBLER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaGarenne, 62510 Arques, France
Filed Jan. 3, 1980, Ser. No. 109,353
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—14



260,840
DISPLAY PLATE HAVING A REMOVABLE TEMPLATE
Sheldon Lieberman, Allentown, Pa., assignor to Binney & Smith, Northampton, Pa.
Filed Dec. 12, 1977, Ser. No. 859,656
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—22

260,841
BOLOGNA CUTTER
Nancy K. Gilmore, 109 Shamrock Dr., Summerville, S.C. 29483
Filed Nov. 13, 1979, Ser. No. 2,879
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—43

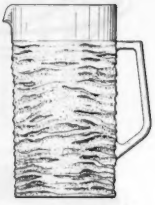


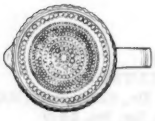
260,842

PITCHER

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 13, 1979, Ser. No. 29,610
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—64



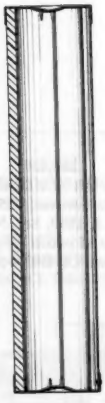


260,843

INSULATED HOLDER FOR BEVERAGE CANS OR THE LIKE

Richard A. Laird, Oakwood Close, Chiselhurst, Kent, and Geoffrey Burnham, The White House, North End La., Kent, both of England

Filed Jan. 17, 1979, Ser. No. 4,245
Claims priority, application United Kingdom, Jul. 19, 1978, 985513/78; Jan. 2, 1979, 987913/79
Term of patent 14 years
Int. Cl. D07—*07*
U.S. Cl. D7—77



260,844

COVER FOR A FOOD CONTAINER

Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.

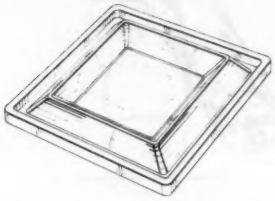
Filed Feb. 12, 1979, Ser. No. 11,245

The portion of the term of this patent subsequent to Jan. 20, 1995, has been disclaimed.

Term of patent 14 years

Int. Cl. D07—*01, 07*

U.S. Cl. D7—131



260,845

RECORD BRUSH OR SIMILAR ARTICLE

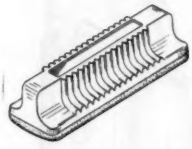
Virgil R. Friebel, Longmont, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Apr. 11, 1979, Ser. No. 29,580

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D32—40



260,846

PLASMA CUTTING-WELDING TORCH HEAD

John E. Summers, 302 Meacham St., Charlotte, N.C. 28203, and Hiroshi Tanida, 5-2-1, Sakuragawa, Naniwa-Ku, Osaka, Japan

Filed Feb. 5, 1979, Ser. No. 9,534

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—30

260,847

PNEUMATIC ORBITAL POLISHER

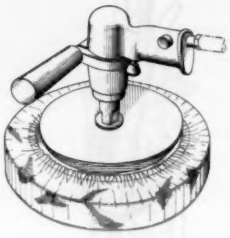
Irving Biederman, 4166 Inverrary Dr., Lauderhill, Fla. 33319

Filed Apr. 25, 1979, Ser. No. 33,336

Term of patent 14 years

Int. Cl. D8—*01*

U.S. Cl. D8—62



260,848

SET OF VICE BLOCKS

Arley C. Hemeyer, Johnson County, Kans., assignor to Unique Products, Lenexa, Kans.

Filed Sep. 27, 1979, Ser. No. 79,509

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—71

260,849

HANDLE FOR ABRADING TOOL

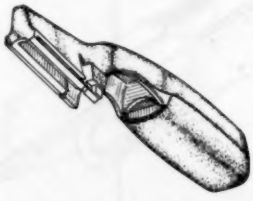
Robert F. West, W. Simsbury, and Laird F. Covey, Easton, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 21, 1978, Ser. No. 971,933

Term of patent 14 years

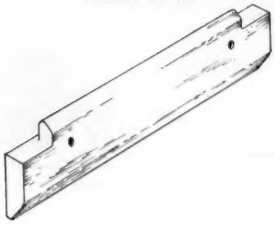
Int. Cl. D8—*05*

U.S. Cl. D8—94

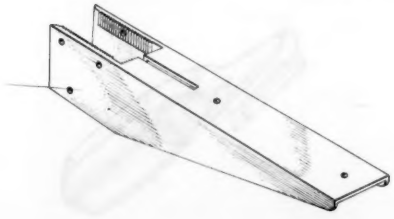


260,850
MEDICAL FLEXIBLE TUBE SUPPORT
Gordon M. Greenblatt, 5800 N. 19th Ave., Phoenix, Ariz. 85015
Filed May 29, 1979, Ser. No. 43,826
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

260,851
WASTEBASKET HANGER
Pamela J. Parker, 8456 E. Wildcat Dr., Tucson, Ariz. 85730
Filed Oct. 2, 1978, Ser. No. 947,705
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—376

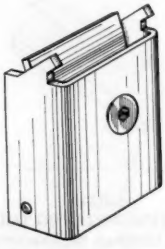


260,852
SHELF BRACKET
Lester L. Loeschen, P.O. Box 621, Mishawaka, Ind. 46544
Filed May 14, 1979, Ser. No. 38,542
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—381

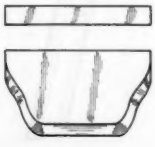


260,853
CHAIN ANCHOR FOR A CONCRETE FLOOR OR THE LIKE
William J. Meis, 6 Valley Dr., Crescent, Iowa 51526
Filed Sep. 26, 1977, Ser. No. 836,645
Term of patent 14 years
Int. Cl. D8—*08, 99*
U.S. Cl. D8—385

260,854
CONNECTING COUPLING FOR JOINING STRUCTURAL MEMBERS
Jean-Francois Sergeant, 105, Rue Anatole France, 92290 Chatenay Malabry, France
Filed Dec. 12, 1978, Ser. No. 968,781
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395

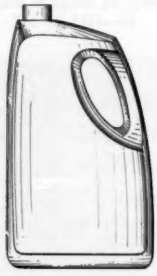


260,855
CORNER GUARD
Haydn H. Hobson, 420 Reed Cir., Napa, Calif. 94558
Filed May 11, 1979, Ser. No. 38,085
Term of patent 14 years
Int. Cl. D8—*99*; D6—*06*
U.S. Cl. D8—403



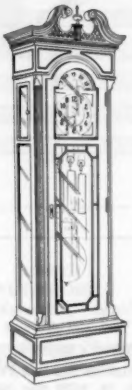
260,856
BOTTLE
Arlen R. Sillerud, 807 E. Third Ave., Ada, Minn. 56510
Filed Sep. 4, 1979, Ser. No. 71,874
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—372

260,857
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Drackett Company, Cincinnati, Ohio
Filed Oct. 9, 1979, Ser. No. 83,078
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376



260,858
COMBINED BOTTLE AND CAP
André Courréges, 27 rue Delabordére, Neuilly sur Seine, Hauts de Seine, France
Filed Nov. 3, 1978, Ser. No. 957,416
Claims priority, application France, May 3, 1978, 41341
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—386

260,859
GRANDFATHER CLOCK WITH MIRRORED MOVEMENT
John Boukma, Grandville, Mich., assignor to Howard Miller Clock Company, Zeeland, Mich.
Filed Oct. 22, 1979, Ser. No. 87,462
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—16

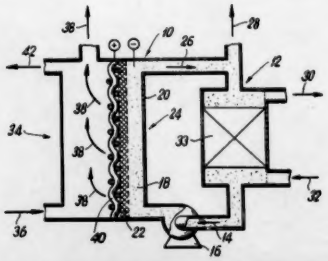


260,860
PARKING GUIDE
Theodore L. Doman, 32863 Myrna, Livonia, Mich. 48154
Filed Feb. 21, 1979, Ser. No. 12,968
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—110

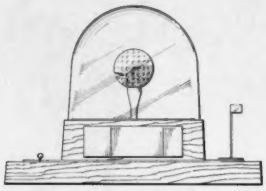
260,861
BARREL-SHAPED PENDANT
Sang W. Han, 444 Nahua St., #910, Honolulu, Hi. 96815
Filed Dec. 26, 1979, Ser. No. 107,184
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

260,862
JEWEL SETTING CROWN OR THE LIKE
Jesse O. Linzer, 760 Market St., San Francisco, Calif. 94102
Filed Feb. 28, 1979, Ser. No. 15,925
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—92

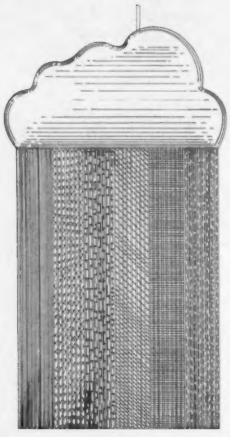
260,863
ARTIFICIAL CHRISTMAS GARNITURE
Stephanie J. Green, 22323 Erwin St., Woodland Hills, Calif. 91367
Filed May 29, 1979, Ser. No. 42,731
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—121



260,864
TROPHY
Richard C. Perry, 1675 Hays St., San Francisco, Calif. 94577
Filed May 4, 1979, Ser. No. 35,921
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



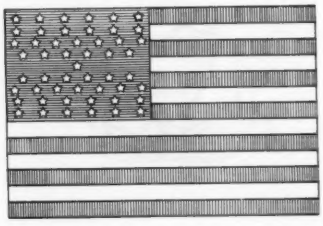
260,865
SOFT SCULPTURE
Kerry L. Smith, 299 Hillcrest Dr., Leucadia, Calif. 92024
Filed Aug. 13, 1979, Ser. No. 65,916
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



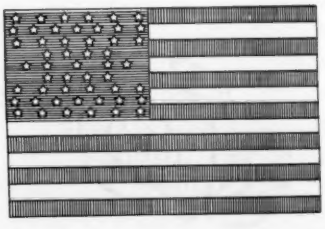
260,866
NOVELTY TROPHY AND BASE THEREFOR
M. David Richards, 1109 E. Date St., Brea, Calif. 92621
Filed Sep. 17, 1979, Ser. No. 76,247
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

260,867
FIGURINE OR SIMILAR ARTICLE
Homer E. Evans, 2107 N. 70th Pl., Scottsdale, Ariz. 85257
Filed Oct. 22, 1979, Ser. No. 86,746
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

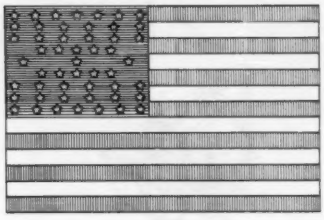
260,868
FLAG
Harold Chaskin, 131 Bennett Ave., New York, N.Y. 10033
Filed Mar. 23, 1979, Ser. No. 23,132
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—180



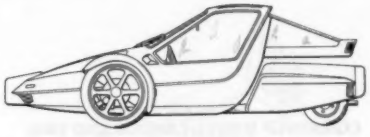
260,869
FLAG
Harold Chaskin, 131 Bennett Ave., New York, N.Y. 10033
Filed May 16, 1979, Ser. No. 39,344
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—180



260,870
FLAG
Harold Chaskin, 131 Bennett Ave., New York, N.Y. 10033
Filed May 16, 1979, Ser. No. 39,345
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—180

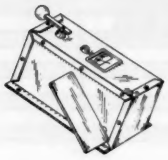


260,871
AUTOMOBILE
W. Allen Cargile, 4210 Estes Rd., Nashville, Tenn. 37215
Filed Dec. 4, 1978, Ser. No. 966,107
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—85

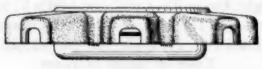


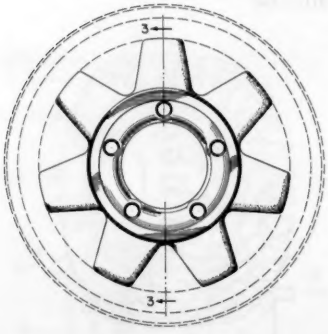
260,872
TIRE
David A. Wright, Louisville, Colo., and Maija V. Strauts, Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Feb. 21, 1980, Ser. No. 123,221
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

260,873
FOOT CONTROL FOR AN ELECTRIC GOLF CAR OR THE LIKE
Craig A. Johnson, R.R. Rte. 1, Lake View, Iowa 51450
Filed Feb. 21, 1979, Ser. No. 13,258
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—174

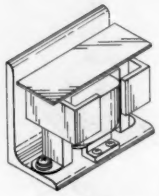


260,874
COMBINED WHEEL CENTER AND HUB
Merlyn R. Reppert, 28045 Palos Verdes Dr. E., Rancho Palos Verdes, Calif. 90274
Division of Ser. No. 85,401, Oct. 16, 1979. This application Aug. 8, 1980, Ser. No. 176,598
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

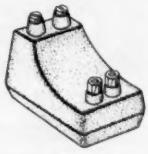




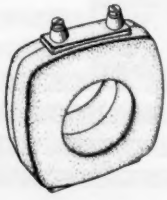
260,875
POWER SUPPLY MODULE
John W. Tully Jr., San Diego, Calif., assignor to Omni-Dynamics, Inc., San Diego, Calif.
Filed Oct. 6, 1978, Ser. No. 949,246
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—01



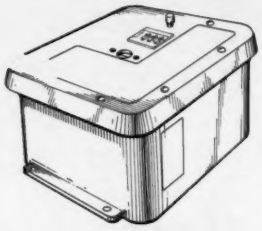
260,876
CURRENT-TO-VOLTAGE TRANSFORMER
Robert S. Pershyn, Buffalo, N.Y., assignor to Clarence Controls Inc., Buffalo, N.Y.
Filed Sep. 7, 1979, Ser. No. 73,257
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4



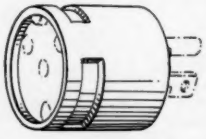
260,877
PRECISION CURRENT TRANSFORMER
Brent E. Scott, and Robert S. Pershyn, both of Buffalo, N.Y., assignors to Clarence Controls Inc., Buffalo, N.Y.
Filed Sep. 7, 1979, Ser. No. 73,258
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4



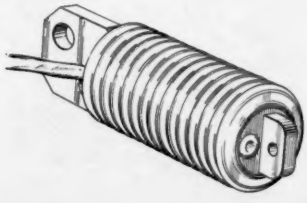
260,878
JUNCTION BOX
Kevin D. Dolinar, Canonsburg, and John F. Burr, Bethel Park, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.
Filed Nov. 22, 1978, Ser. No. 963,106
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13



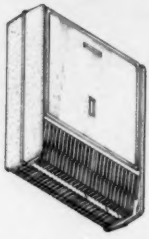
260,879
ELECTRICAL CONNECTOR HOUSING
Radosav Avramovich, Libertyville, Ill., assignor to Daniel Woodhead, Inc., Northbrook, Ill.
Filed Aug. 3, 1978, Ser. No. 930,729
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—28



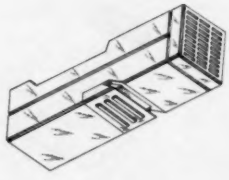
260,880
WEIGHING TRANSDUCER
Martin Spoor, Cambridge, Mass., assignor to Bofors America, Inc., Edison, N.J.
Filed Oct. 26, 1978, Ser. No. 954,908
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—99



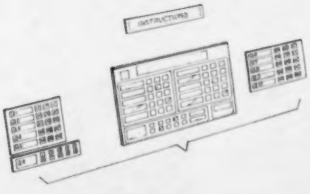
260,881
MEMORY MODULE HOUSING
Kevin P. McKinsey, Scotts Valley, and James C. Asher, San Jose, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.
Filed Mar. 22, 1979, Ser. No. 22,571
Term of patent 14 years
Int. Cl. D14—*01*; D16—*99*
U.S. Cl. D14—11



260,882
MICROPHONE
Lawrence G. McCain, Beverly Hills, Calif., assignor to Answerex, Inc., Los Angeles, Calif.
Filed Oct. 26, 1978, Ser. No. 955,094
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



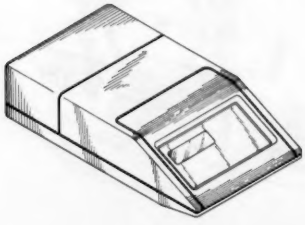
260,883
VARIABLE KEYBOARD FOR COMPUTER TERMINAL, OR THE LIKE
Martin D. Husted, Simi Valley, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.
Filed Jan. 10, 1979, Ser. No. 2,258
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—115



260,884
TELLER'S MACHINE
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 4, 1978, Ser. No. 965,729
Claims priority, application Japan, Jun. 9, 1978, 53-24049
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—105

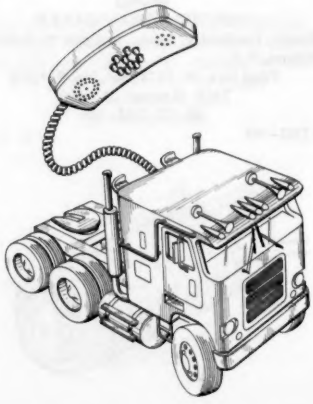
260,885
SPIROMETRIC COMPUTER
William C. Jones, 36 Baybrook La., Ginger Creek, Oak Brook, Ill. 60521
Filed Feb. 23, 1979, Ser. No. 14,424
Term of patent 14 years
Int. Cl. D14—*02*; D24—*01*
U.S. Cl. D14—106

260,886
VEHICULAR TWO-WAY DATA TERMINAL OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 19, 1979, Ser. No. 21,523
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100

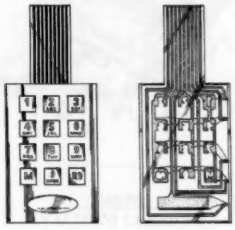


260,887
DISPLAY SCREEN-TERMINAL
Hartmut Esslinger; Andreas Haug, and Georg Spreng, all of Altensteig, Fed. Rep. of Germany, assignors to CTM Computertechnik Müller GmbH, Fed. Rep. of Germany
Filed Apr. 23, 1979, Ser. No. 32,533
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 195
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

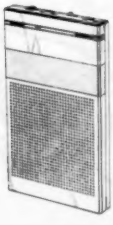
260,888
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed May 7, 1979, Ser. No. 36,593
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



260,889
TOUCH-PAD FOR A TELEPHONE
James D. McLean, 1133 Blaine Ave., Riverside, Calif. 92507, and David E. Snider, 1649 Davis, Corona, Calif. 91720
Filed Jan. 2, 1979, Ser. No. 297
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

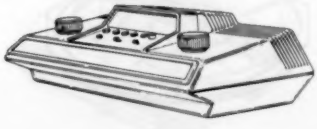


260,890
RADIO RECEIVER
Iwao Nakajima; Kikuo Ohta, both of Ikoma, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 30, 1979, Ser. No. 99,190
Claims priority, application Japan, May 31, 1979, 54-22451
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

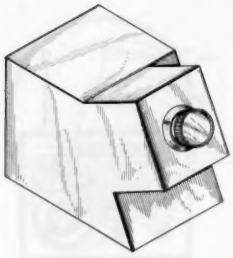


260,891
PORTABLE RADIO
David Fink, Dix Hills, N.Y., assignor to Windsor Industries, Inc., Mellville, N.Y.
Filed Dec. 4, 1978, Ser. No. 966,468
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

260,892
COMBINED CLOCK, RADIO AND LAMP
Wing H. Yeung, 79 Chun Yeung St., 7th Floor, Hong Kong
Filed May 8, 1979, Ser. No. 37,230
Claims priority, application United Kingdom, Nov. 9, 1978, 987213
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73

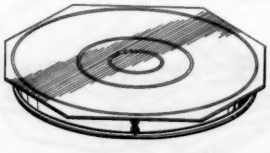


260,893
PROJECTION TELEVISION CABINET OR SIMILAR ARTICLE
Emilio J. Verrillo, 634 Meadowbrook Ave., Ambler, Pa. 19002
Filed Nov. 27, 1979, Ser. No. 97,817
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—77

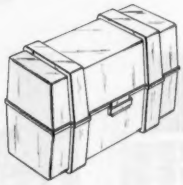


260,894
TELEVISION CAMERA
Konrad Ellermeier, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 13, 1978, Ser. No. 895,931
Claims priority, application Benelux, Oct. 17, 1977, 52225-00
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—78

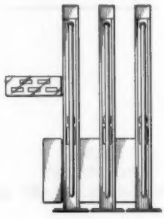
260,895
DIRECTIONAL ANNULAR SLOT ANTENNA
Arthur Luedtke, Marietta, and William F. Bentley, Smyrna, both of Ga., assignors to The United States of America as represented by Field Operations Bureau Office, FCC, Washington, D.C.
Filed Mar. 14, 1979, Ser. No. 20,295
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86



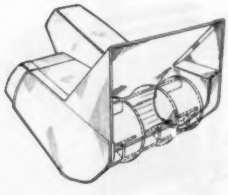
260,896
AIR COMPRESSOR
Edwin L. Schwartz, and Allen W. Langan, both of Los Angeles, Calif., assignors to Rite Autotronics Corporation, Los Angeles, Calif.
Filed Oct. 24, 1979, Ser. No. 87,727
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9



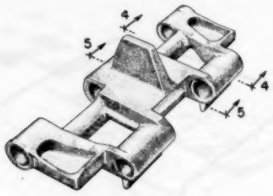
260,897
MULTI-PRODUCT FUEL DISPENSER
John A. Todd, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 17, 1978, Ser. No. 952,166
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9.2



260,898
SNOW THROWER HOUSING
Robert Chieda; Robert W. Johnson, both of Westport, Conn.; Douglas W. Smith, Oakland, N.J., and Eugene J. Casey, Jr., Rowayton, Conn., assignors to The Toro Company, Minneapolis, Minn.
Filed Jan. 16, 1980, Ser. No. 112,539
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D15—12



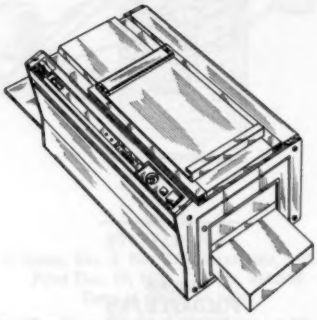
260,899
VEHICLE TRACK SHOE
George L. Joseph, Morgan Hill, and George A. Travinski, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.
Filed Oct. 27, 1978, Ser. No. 955,299
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—28



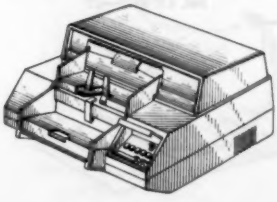
260,900
VACUUM CLEANER
Tönis Kiio, Munich, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 2, 1979, Ser. No. 656
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 4852
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—22

260,901
VACUUM CLEANER ACCESS PLATE
Don W. Vermillion, Anderson, S.C., assignor to The Singer Company, Stamford, Conn.
Filed Jun. 22, 1979, Ser. No. 51,335
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32

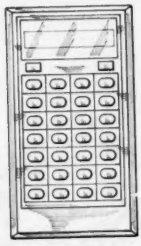
260,902
ELECTROSTATIC COPYING MACHINE
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 25, 1979, Ser. No. 42,624
Claims priority, application Japan, Dec. 4, 1978, 53-51512
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



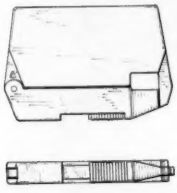
260,903
MICROFILM CAMERA
John W. Overman, Phoenix, Ariz., assignor to Bell & Howell Company, Del.
Filed Jun. 4, 1979, Ser. No. 45,486
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—27



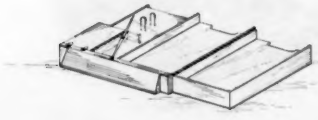
260,904
COMBINED ELECTRONIC CALCULATING MACHINE AND TIMEPIECE
Matafumi Ikeda, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 16, 1979, Ser. No. 85,332
Claims priority, application Japan, Apr. 20, 1979, 54/16480
Term of patent 14 years
Int. Cl.[3] D18—*01*
U.S. Cl. D18—7



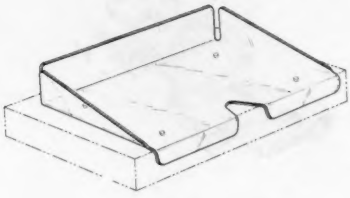
260,905
FOLDABLE PEN
Michael C. Klaber, 10526 Caminito Obra, San Diego, Calif. 92126
Filed Dec. 4, 1978, Ser. No. 966,239
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—41



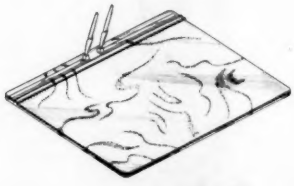
260,906
COMBINED DESK TRAY, CALENDAR PAD HOLDER AND DESK SET
Dale E. Grusing, 4917 - 15th St., Lubbock, Tex. 79416
Filed Jun. 5, 1978, Ser. No. 912,568
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—77



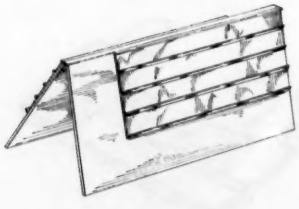
260,907
DESK TRAY
James E. Giulie, and Joe D. Giulie, both of 1015 Corporation Way, Palo Alto, Calif. 94303
Filed Jul. 30, 1979, Ser. No. 61,813
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



260,908
COMBINED DESK PAD AND PEN ASSEMBLIES
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 18, 1978, Ser. No. 907,380
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—95



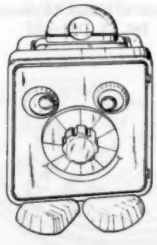
260,909
GAME BOARD
M. David Richards, 1109 E. Date St., Brea, Calif. 92621
Filed Apr. 9, 1979, Ser. No. 28,060
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15



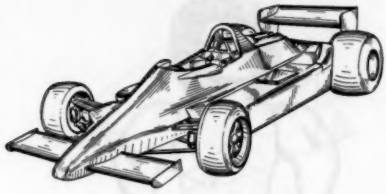
260,910
GAME BOARD
Harold L. Moseley, 102 Talco Rd., Lancaster, Tex. 75146
Filed Jul. 24, 1978, Ser. No. 927,118
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15

260,911
TOY WHIRLER OR SIMILAR ARTICLE
Edward C. Anderson, 6750 School St., Apt. 306, Des Moines, Iowa 50311
Filed Oct. 30, 1978, Ser. No. 956,072
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—92

260,912
TOY SAFE
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039; Paul B. Means, III, Basking Ridge, N.J.; James J. Wilcox, Summit, N.J., and David W. Reina, Huntington, N.Y., assignors to Mel Appel, Livingston, N.J.
Filed Apr. 11, 1979, Ser. No. 29,114
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122



260,913
MODEL RACING CAR
Anthony C. B. Chapman, Norwich, England, assignor to Lotus Cars Limited, Norfolk, England
Filed Nov. 3, 1978, Ser. No. 957,341
Claims priority, application United Kingdom, May 3, 1978, 984427/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137



260,914
STUFFED TOY
Georgia A. Jones, Rte. 1, Box 213, Myersville, Md. 21773
Filed Dec. 19, 1977, Ser. No. 861,655
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—148

260,915
ORNAMENTAL DESIGN FOR A DUCK
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Oct. 22, 1979, Ser. No. 87,082
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D21—160

260,916
DOLL
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Oct. 19, 1979, Ser. No. 86,287
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—171

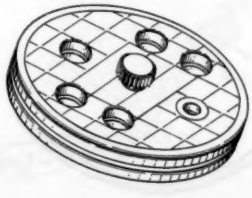
260,917
DOLL
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Oct. 19, 1979, Ser. No. 86,286
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—177

260,918
DOLL
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Oct. 22, 1979, Ser. No. 87,169
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—177

260,919
RACKET BALL HOLDER
James M. DeLuca, 2535 E. Bethel St., Anaheim, Calif. 92806
Filed Jun. 20, 1979, Ser. No. 50,448
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—206

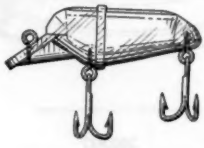
260,920
CURLING BROOM
Fernand Marchessault, 2251 Sherbrooke St., Montreal, Canada (H2K 1E4)
Filed Jul. 13, 1979, Ser. No. 57,311
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—211

260,921
RACQUET SWING WEIGHT DEVICE
Pedro B. Mena, Box 1046, Morgan Hill, Calif. 95037
Filed Sep. 12, 1979, Ser. No. 75,002
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

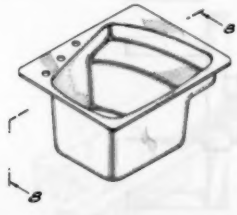


260,922
TENT
Maxwell W. Day, 401-5 Little Bourke St., Melbourne, Victoria, Australia
Filed Jul. 12, 1978, Ser. No. 923,983
Claims priority, application Australia, Jun. 13, 1978, 75043
The portion of the term of this patent subsequent to Jun. 23, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—253

260,923
FISHING LURE
James R. Cope, 10500 Cherokee La., Leawood, Kans. 66206
Filed Feb. 8, 1980, Ser. No. 119,678
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



260,924
SINK
Michael E. Hurray, 313 Diamond, Balbon Island, Calif. 92662
Filed Aug. 6, 1979, Ser. No. 64,198
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



260,925

CASTING FOR FIREPLACE HEAT EXCHANGER

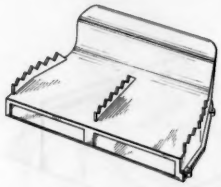
Thomas V. Metz, Portland, and W. James Sirois, Beaverton, both of Oreg., assignors to Pacific Fireplace Furnishings, Inc., Portland, Oreg.

Filed Dec. 7, 1978, Ser. No. 967,439

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—127



260,926

DISPENSER FOR AIR TREATING MATERIAL

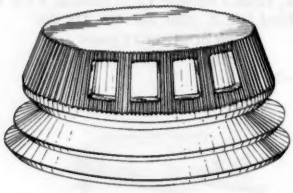
Russell L. Dusek, Armonk, N.Y., assignor to The Drackett Company, Cincinnati, Ohio

Filed Aug. 1, 1980, Ser. No. 174,398

Term of patent 14 years

Int. Cl. D23—*04*

U.S. Cl. D23—150



260,927

DOWELL PIN POSITIONER

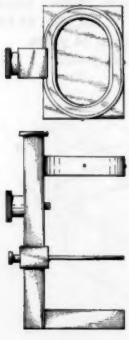
Edward C. Glenn, 1455 NE. 55th St., Fort Lauderdale, Fla. 33334

Filed Mar. 14, 1979, Ser. No. 20,522

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—10



260,928

BODY MASSAGER

Jean-Louis H. Gueret, Paris, France, assignor to L'Institut Jeanne Piaubert, Paris, France

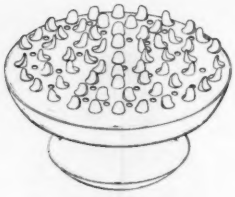
Filed Dec. 10, 1979, Ser. No. 101,797

Claims priority, application France, Jul. 25, 1979, 79 77767

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D24—36



260,929

RECTANGULAR SLIDE SPA

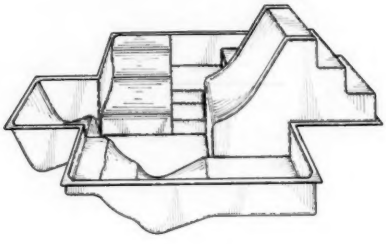
John L. Haller, 7249 Carrizo Dr., La Jolla, Calif. 92037

Filed Dec. 6, 1978, Ser. No. 966,907

Term of patent 14 years

Int. Cl. D24—*01;* D23—*02*

U.S. Cl. D24—38



260,930

COVER FOR A HYDROTHERAPY POOL OR THE LIKE

Jonathan Watkins, San Marcos, Calif., assignor to Watkins Manufacturing Co., San Marcos, Calif.

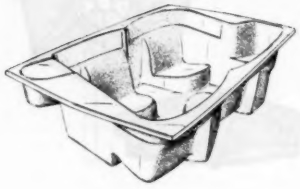
Filed Jan. 29, 1979, Ser. No. 7,334

Term of patent 14 years

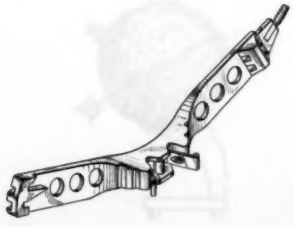
Int. Cl. D24—*01*

U.S. Cl. D24—38

260,931
HYDROTHERAPY SPA
Richard G. Reineman, Newport Beach, Calif., assignor to Marlin Fiberglass, Inc., Huntington Beach, Calif.
Filed Aug. 27, 1979, Ser. No. 69,801
Term of patent 14 years
Int. Cl. D24—*01;* D25—*99;* D23—*02*
U.S. Cl. D24—38



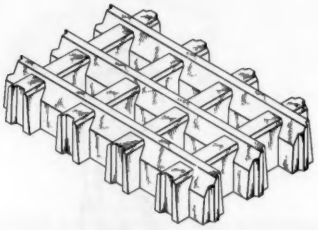
260,932
NASO-GASTRIC TUBE STABILIZER
Ingram S. Chodorow, Upper Saddle River, N.J., and Richard Hall, New Canaan, Conn., assignors to Technalytics, Inc., Upper Saddle River, N.J.
Filed Jan. 8, 1979, Ser. No. 1,759
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—53



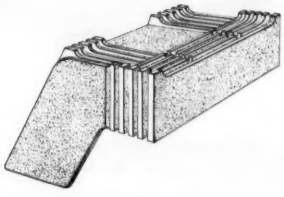
260,933
INHALATOR
Ernst Reichl, Munich, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany
Filed Aug. 10, 1978, Ser. No. 932,757
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 4809
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—62

260,934
RAILROAD RESTAURANT
Gary M. Levin, 940 E. 19 St., Brooklyn, N.Y. 11230
Division of Ser. No. 928,387, Jul. 27, 1978. This application Apr. 30, 1980, Ser. No. 145,049
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11

260,935
PAVING BLOCK
Thomas Pratt, deceased, late of Farnham Royal, England (by Gladys E. Pratt, executrix), assignor to Mono Concrete Limited, Groydon, England
Filed Oct. 25, 1978, Ser. No. 954,613
Claims priority, application United Kingdom, Apr. 27, 1978, 984358/78
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—91

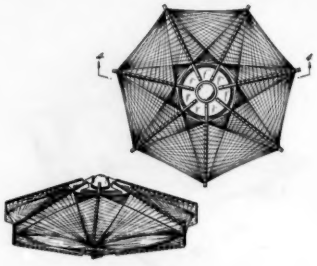


260,936
COMBINATION TRUCK TAIL LIGHT AND LICENSE PLATE HOLDER
Hans E. Strand, Uppsala, Sweden, assignor to Kjell Folke Ohlson, Sweden
Filed Aug. 22, 1978, Ser. No. 936,582
Claims priority, application Sweden, Feb. 22, 1978, 780514
Term of patent 14 years
Int. Cl. D26—*06;* D20—*03*
U.S. Cl. D26—28



260,937
AUXILIARY LIGHT FOR VEHICLE HAVING ATTACHED PLOW BLADE
Vernon L. Hetrick, North Olmsted, Ohio, assignor to Meyer, Products, Inc., Cleveland, Ohio
Filed Nov. 15, 1978, Ser. No. 961,030
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—35

260,938
LUMINAIRE
Frederic Zurcher, Le Paquis, St. Julien en Genevois, France (74160)
Filed May 23, 1978, Ser. No. 908,841
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—91



260,939
LUMINAIRE
Frederic Zurcher, Le Paquis, St. Julien en Genevois, France (74160)
Filed May 23, 1978, Ser. No. 908,842
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93

260,940
DECORATIVE LAMP
John H. Holtvoigt, Tipp City, Ohio, assignor to The Dolly Toy Company, Tipp City, Ohio
Filed Feb. 21, 1979, Ser. No. 13,051
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—97

260,941
LIGHTER
Bernd Figur, Rodgau, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Oct. 2, 1978, Ser. No. 948,198
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 510097
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

260,942
LIGHTER
Franz A. Stuetzer, Mühlheim, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Apr. 23, 1979, Ser. No. 32,202
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 510144
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

260,943
LIGHTER
Franz A. Stützer, Mühlheim, and Bernd Figur, Seligenstadt, both of Fed. Rep. of Germany, assignors to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Jul. 2, 1979, Ser. No. 54,372
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1979, 510153
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

260,944
RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Aug. 1, 1979, Ser. No. 62,881
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Company: *See—*
Gibson, Joseph T.; and Duhon, Gerald L., 4,290,305, Cl. 73-155.000.

AB Dentatus: *See—*
Edwardson, Svante R., 4,290,754, Cl. 433-56.000.

AB Lyckeaborgs Bruk: *See—*
Blomqvist, John-Erik V.; and Blomqvist, Erik M., 4,291,195, Cl. 174-48.000.

AB Svenska Flaktfabriken: *See—*
Johansson, Eric G. B., 4,290,210, Cl. 34-156.000.

Abbott Laboratories: *See—*
Bujan, Albert F., 4,290,346, Cl. 92-90.000.

Abbott, Randle L., to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft. Continuously variable transmission mechanisms. 4,290,320, Cl. 74-689.000.

Abbott, Seth R., to Varian Associates, Inc. Anion exchange chromatographic separation of polyfunctional compounds. 4,290,892, Cl. 210-656.000.

Abe, Shigeya: *See—*
Iyoda, Michio; and Abe, Shigeya, 4,290,406, Cl. 123-645.000.

Abel, Heinz, to Ciba-Geigy Corporation. Process for slop-padding textile cellulose material. 4,290,767, Cl. 8-496.000.

Abeler, Gerd: *See—*
Schneider, Rainer; and Abeler, Gerd, 4,290,942, Cl. 260-45.85H.

Ableitner, Erich: *See—*
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,290,397, Cl. 123-195.00A.

ACF Industries, Inc.: *See—*
Basch, Walter E., 4,290,347, Cl. 92-102.000.
Moran, George A.; and Williams, John B., 4,290,581, Cl. 251-172.000.
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Acquati, Giancarlo; Berti, Giovanni; and Fossati, Piero, to Miles Laboratories, Inc. Bilirubin-resistant determination of uric acid and cholesterol. 4,291,121, Cl. 435-10.000.

Adachi, Masami: *See—*
Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, 4,291,127, Cl. 560-76.000.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic booster. 4,290,340, Cl. 91-31.000.

Adamovic, Emilija, to Sherritt Gordon Mines Limited. Composite powders sprayable to form abradable seal coatings. 4,291,089, Cl. 428-325.000.

Adams, Frederick J., to Cam Gears Limited. Gear assembly. 4,290,344, Cl. 91-467.000.

Adams, Harry A.; and Fitzgibbons, William O., to Standard Oil Company (Ohio). Process for removal of water soluble particulate material from gas streams. 4,290,783, Cl. 55-89.000.

Adams, Mamie I. Blair: *See—*
Blair, Joseph N., 4,290,231, Cl. 49-173.000.

Adams, Peter J.: *See—*
Ruhe, Anthony; and Adams, Peter J., 4,290,388, Cl. 122-235.00A.

Adams, Rose M.: *See—*
Anema, Pieter J.; Haisman, Derek R.; and Adams, Rose M., 4,291,066, Cl. 426-578.000.

Adams, William J.; Wernet, William F.; and Haskins, Steve W., to Northern Telecom, Inc. Telephone handset chassis and flexible printed circuit. 4,291,202, Cl. 179-103.000.

Adaniya, Takeshi: *See—*
Matsudo, Kazuo; Adaniya, Takeshi; Ohmura, Masaru; Shoji, Masahiro; and Watanabe, Tsutomu, 4,290,860, Cl. 204-27.000.

Adrian, Adolf: *See—*
de Baan, Johannes J.; and Adrian, Adolf, 4,290,511, Cl. 188-322.170.

Advanced Machine and Tool Corporation: *See—*
Arnold, Richard B., 4,290,190, Cl. 29-596.000.

Aeroquip Corporation: *See—*
Knowles, Steven M., 4,290,276, Cl. 62-299.000.

Agence National de Valorization de la Recherche: *See—*
Pinard, Michel; Aminoff, Carl; Trenec, Gerard; and Laloe, Franck, 4,291,281, Cl. 331-94.50C.

Agfa-Gevaert AG: *See—*
Ludemann, Heinz; and Ziegler, Franz, 4,290,594, Cl. 271-180.000.

Agostino, Michael. Light-weight floor-standing drain cleaner. 4,290,162, Cl. 15-104.3SN.

Ahrbeck, Harold, to Du Pont de Nemours, E. I., and Company. Thermoplastic pipe stub end. 4,290,456, Cl. 138-109.000.

Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, to Hitachi, Ltd. Electron tube cathode. 4,291,252, Cl. 313-346.00K.

Aileo, Jackson A., to Gentex Corporation. Method of making an individually fitted helmet. 4,290,149, Cl. 2-414.000.

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Cebalo, Tony; and Walde, Robert A., 4,290,798, Cl. 71-90.000.

Aisaka, Tatsuyoshi; Kawai, Mitsuo; Mori, Fumio; and Sugai, Shinzo, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing bimetal. 4,290,828, Cl. 148-11.50Q.

Aisan Industry Co., Ltd.: *See—*
Takada, Shigetaka; and Morino, Toshiharu, 4,290,399, Cl. 123-439.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Adachi, Yoshiharu, 4,290,340, Cl. 91-31.000.

Aiyama, Fumihiko: *See—*
Hiramatsu, Kenzo; and Aiyama, Fumihiko, 4,290,165, Cl. 15-330.000.

Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, to Nissan Chemical Industries, Ltd. Plasticizer composition. 4,291,127, Cl. 560-76.000.

Akagi, Akio: *See—*
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, 4,291,010, Cl. 423-594.000.

Akebono Brake Industry Co. Ltd.: *See—*
Maehara, Toshifumi; and Kawase, Kazuo, 4,290,265, Cl. 60-561.000.

Aketa, Masahiro: *See—*
Sakano, Kenji; Yamashita, Masahiro; Yamashita, Kenji; and Aketa, Masahiro, 4,290,395, Cl. 123-192.00B.

Akimoto, Shinichi: *See—*
Tanizaki, Yoshiharu; Minagawa, Kenichiro; Akimoto, Shinichi; and Horioka, Kuninori, 4,291,101, Cl. 428-514.000.

Akzona Incorporated: *See—*
Henry, Charles L., 4,290,815, Cl. 106-203.000.

Albertson, Michael D.: *See—*
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., 4,290,316, Cl. 74-5.460.

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Montgrain, Luc, 4,290,590, Cl. 266-225.000.

Alderman, Robert J. Fluid flow insulation system. 4,290,247, Cl. 52-173.00R.

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Ali Khan, Eskendar: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,291,037, Cl. 424-253.000.

Allain, Ronald J.; and Maniscalco, Joseph P., to Nalco Chemical Company. Preparation of tetramethyldisilane from 1,2-tetramethyldichlorodisilane. 4,291,167, Cl. 556-430.000.

Alldredge, Robert L. Dust collector and method of operation. 4,290,785, Cl. 55-96.000.

Allen-Bradley Company: *See—*
Ecker, Donald R., Jr.; Dummermuth, Ernst; and Struger, Odo J., 4,291,388, Cl. 364-900.000.

Allen, Richard A. Foldable bicycle carrier. 4,290,540, Cl. 224-314.000.

Allied Chemical Corporation: *See—*
Ray, Ranjan, 4,290,808, Cl. 75-251.000.
Segal, Leon, 4,291,084, Cl. 428-212.000.
Smith, Robert W.; Hemmat, Naim S.; Bedell, John R.; Kavesh, Sheldon; and Draizen, Seymour, 4,290,476, Cl. 164-423.000.

Alloy Surfaces Company, Inc.: *See—*
Baldi, Alfonso L., 4,290,391, Cl. 122-511.000.

Alpha Solarco Inc.: *See—*
Uroshevich, Miroslav, 4,290,418, Cl. 126-439.000.

Alps Electric Company, Ltd.: *See—*
Ijichi, Sadayoshi; and Nishizawa, Eiji, 4,291,290, Cl. 334-1.000.
Shirakawa, Takashi, 4,291,361, Cl. 361-293.000.

Altman, Jay C.: *See—*
Boots, W. Stewart; and Altman, Jay C., 4,290,373, Cl. 111-3.000.

Alucaps Italiana S.p.A.: *See—*
Reina, Erminia, 4,290,535, Cl. 215-270.000.

Aluminum Company of America: *See—*
McMonigle, Matthew J.; and Klingensmith, Chester H., 4,290,874, Cl. 204-243.00R.

ALZA Corporation: *See—*
Luschen, Joseph G.; and Theeuwes, Felix, 4,290,426, Cl. 128-260.000.

Amada Company, Ltd.: *See—*
Washio, Isomi; and Onishi, Kenji, 4,290,330, Cl. 83-820.000.

Amancharla, Amareswar: *See—*
Beall, Clifford H.; Amancharla, Amareswar; and Luke, Michael A., 4,290,484, Cl. 166-242.000.

Ameling, Dieter: *See—*
Sensis, Siegfried; Schwerdtfeger, Joachim; Walden, Klaus; and Ameling, Dieter, 4,290,800, Cl. 75-12.000.

American Cyanamid Company: *See—*
Conrow, Ransom B.; and Bernstein, Seymour, 4,291,169, Cl. 560-45.000.
Poulos, Andrew C.; and Thibodeau, Michael J., 4,291,005, Cl. 423-321.00R.
Tobkes, Martin; Dann, Murray; Klothen, Irving; Spicer, Larry D.; and Williams, David R., 4,291,026, Cl. 424-181.000.
Wissner, Allan; and Floyd, Middleton B., Jr., 4,291,174, Cl. 568-330.000.
Wissner, Allan; and Floyd, Middleton B., Jr., 4,291,175, Cl. 568-330.000.

American Home Products Corporation: *See—*
Freed, Meier E.; and Diebold, James L., 4,290,952, Cl. 260-326.470.
Helfer, Joel N.; and Ferrara, Elisa M., 4,290,425, Cl. 128-133.000.

American Newspaper Publishers Association: *See—*
Fowler, William H.; and Warner, Frederick L., 4,290,361, Cl. 101-182.000.

American Optical Corporation: *See—*
Siegmund, Walter P., 4,290,421, Cl. 128-6.000.

American Sterilizer Company: *See—*
Orelski, Paula A., 4,291,122, Cl. 435-31.000.

American Telecommunications Corporation: *See—*
Johnson, Walter R.; and Petaja, Gary M., 4,291,201, Cl. 179-90.00K.

Ames, Adolf: *See—*
Wagner, Alfred; and Ames, Adolf, 4,290,290, Cl. 72-256.000.

Aminoff, Carl: *See—*
Pinard, Michel; Aminoff, Carl; Trenec, Gerard; and Laloe, Franck, 4,291,281, Cl. 331-94.50C.

AMP Incorporated: *See—*
Bakermans, Johannes C. W.; and Neiman, Richard A., 4,290,179, Cl. 29-33.00M.

Ampex Corporation: *See—*
Chase, James P., 4,291,354, Cl. 360-129.000.
Gooch, Beverley R., 4,291,352, Cl. 360-121.000.

Amtel, Inc.: *See—*
Kuntz, Francis A., Jr., 4,290,158, Cl. 9-8.00P.

Amundsen, Alan R.: *See—*
Hoeschel, James D.; and Amundsen, Alan R., 4,291,027, Cl. 424-197.000.
Hoeschele, James D.; and Amundsen, Alan R., 4,291,023, Cl. 424-180.000.

Anderson, Arlynn W.: *See—*
Kizer, Richard W.; Anderson, Arlynn W.; and Untz, Robert W., 4,290,990, Cl. 264-156.000.

Anderson, Harry L.: *See—*
Malone, William H.; Fischley, John; Anderson, Harry L.; and Spirko, Edward J., 4,290,751, Cl. 432-214.000.

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Anderson, Roger E.: *See—*
Paine, Ellis H.; and Anderson, Roger E., 4,290,711, Cl. 403-358.000.

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Ando, Kenji: *See—*
Nishiyama, Hiroshi; Nakamura, Takeshi; Kato, Suehiro; and Ando, Kenji, 4,290,876, Cl. 204-298.000.

Andreev, Kino D.: *See—*
Georgiev, Atanas G.; Andreev, Kino D.; and Konstantinova, Kina V., 4,290,971, Cl. 260-453.500.

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Antrim, Richard D.: *See—*
Scharer, Hans R.; Antrim, Richard D.; and Strang, John R., 4,290,742, Cl. 425-313.000.

Anttila, Seppo: *See—*
Rysti, Alpo; Anttila, Seppo; and Maki-Hoimela, Veijo, 4,290,722, Cl. 414-48.000.

Aoki, Akihiro: *See—*
Tamura, Yorikazu; Aoki, Akihiro; and Shimada, Keizo, 4,291,142, Cl. 525-420.000.

Appel, Eggert; Nissen, Peter; Geisler, Gottfried; and Kiene, Wilfried, to Fischer & Porter Company. Electromagnetic flowmeter system. 4,290,313, Cl. 73-861.170.

Appleton Papers Inc.: *See—*
Becker, William J., 4,290,933, Cl. 260-29.6MM.

Apuzzo, Gennaro; and Bocchini, Gian F., to Merisinter S.p.A. Sintered self lubricating bearings. 4,290,655, Cl. 308-121.000.

Arachi, John M.: *See—*
Reavill, Joseph A.; and Arachi, John M., 4,290,838, Cl. 156-286.000.

Araki, Shigeru: *See—*
Taki, Yasuo; Araki, Shigeru; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,290,732, Cl. 414-752.000.

Arbed S.A.: *See—*
Glaesener, Ernest, 4,290,585, Cl. 256-13.100.

Archambel, S.A.: *See—*
van den Berg, Johan H., 4,290,164, Cl. 15-250.320.

Archibald, John H. Kinematic restraint. 4,290,574, Cl. 248-177.000.

Ariga, Tatsuo. Writing instrument having multiple writing elements. 4,290,707, Cl. 401-110.000.

Arlt, Joachim; and Fromm, Dietrich, to Patent-und-Gesellschaft fur elektrische Gluhlampen m.b.H. Discharge lamp energization circuit, particularly for audio and supersonic frequency operation of high-pressure discharge lamps. 4,291,254, Cl. 315-240.000.

Armco Inc.: *See—*
Lawson, John E., 4,290,483, Cl. 166-237.000.

Armstrong Cork Company: *See—*
Rueggeberg, Werner, 4,291,226, Cl. 250-324.000.

Armstrong, Rolfe D., to NCR Corporation. Parity prediction circuitry for a multifunction register. 4,291,407, Cl. 371-49.000.

Arnold, Donald S.; Fairchild, James L.; Nichols, Donald A.; and Coe, Merlin D., to Kerr-McGee Chemical Corporation. Process for producing sodium carbonate from complex brines. 4,291,002, Cl. 423-189.000.

Arnold, Joe F.: *See—*
Jameikis, Saulius M.; Stalcup, Robert K.; Arnold, Joe F.; and Hon, Robert K., 4,290,237, Cl. 51-34.00A.

Arnold, Richard B., to Advanced Machine and Tool Corporation. Method and apparatus for spreading sta.or windings. 4,290,190, Cl. 29-596.000.

Arnold, Robert D. Vehicle speed enforcement signal. 4,291,295, Cl. 340-53.000.

Arthurs, John W.; and Perkowski, Ronald, to Bra-Con Industries, Inc. Welding apparatus having closely mounted shunts. 4,291,214, Cl. 219-86.100.

Asahi Communications Inc.: *See—*
Shimamura, Juky, 4,290,227, Cl. 46-206.000.

Asahi Glass Company, Limited: *See—*
Miyauchi, Seiroku; Sagane, Yasuo; and Irie, Kazuo, 4,290,641, Cl. 296-146.000.
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,290,859, Cl. 204-16.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Komatsu, Kazurou; Matsumoto, Sojiro; Maniwa, Takeshi; and Shinmura, Nobuyuki, 4,290,969, Cl. 260-453.0AB.
Takahashi, Yasunobu; Fujimoto, Einosuke; Shimizu, Toshio; and Kato, Takeo, 4,290,946, Cl. 260-239.00B.

Asai, Tsuyoshi; Fujimori, Naoji; and Yamamoto, Takaharu, to Sumitomo Electric Industries, Ltd. Hard alloy and a process for the production of the same. 4,290,807, Cl. 75-233.000.

Asano, Shuichi: *See—*
Ueda, Takeo; and Asano, Shuichi, 4,290,629, Cl. 280-806.000.

Aslen, Douglas E. Machinery safety guards. 4,290,717, Cl. 408-241.00G.

Associated Engineering Limited: *See—*
Scott, Peter A. J., 4,290,613, Cl. 277-96.100.

Atlantic Richfield Company: *See—*
Leonard, John J., 4,290,968, Cl. 260-453.00P.

Atlas Powder Company: *See—*
Janoski, Florian B., 4,290,366, Cl. 102-202.300.

Aubert, Paul; Quinton, Christian; and Pannier, Gerard, to Regie Nationale des Usines Renault. Apparatus for controlling an automatic transmission. 4,290,324, Cl. 74-866.000.

Auburn International, Inc.: *See—*
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,291,273, Cl. 324-343.000.

Aude, Robert; Baumgartner, Pierre; Desmarquest, Jean-Pierre; and Franck, Jean-Pierre, to Institut Francais du Petrole. Process for manufacturing petroleum sulfonates and the resultant products. 4,290,973, Cl. 260-505.00R.

August Bilstein, Firma: *See—*
de Baan, Johannes J.; and Adrian, Adolf, 4,290,511, Cl. 188-322.170.

Ausschnitt, Christopher P.; and Huchital, David A., to Perkin-Elmer Corporation, The. Coating apparatus. 4,290,384, Cl. 118-722.000.

Auten, Jerry P. Coating system for roofs, swimming pools and the like. 4,291,086, Cl. 428-242.000.

Autotron Equipment Corporation: *See—*
Holm, Donald C., 4,290,205, Cl. 33-180.00R.

Autovox S.p.A.: *See—*
Pera, Vittorio, 4,291,348, Cl. 360-96.400.

Avery, Julian M. Method for producing magnesium. 4,290,804, Cl. 75-67.00R.

Ayres, Peter J.: *See—*
Leigh, Steven; and Ayres, Peter J., 4,291,062, Cl. 424-322.000.

Azar, Charles. Video magazine and package therefor. 4,290,524, Cl. 206-232.000.

Azegami, Hitoshi: *See*—
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,291,100, Cl. 428-424.200.

B. F. Goodrich Company, The: *See*—
Bertsch, Robert J.; and Riew, Changkiu K., 4,290,939, Cl. 260-40.00R.

Babcock & Wilcox Company, The: *See*—
Ball, Russell M.; and Roberts, Robert C., 4,290,851, Cl. 176-24.000.
Larson, Gordon C., 4,290,543, Cl. 228-2.500.
Monter, James V.; Sorenson, James P.; and Theus, George J., 4,290,872, Cl. 204-195.00F.

Babinsky, Andrew D.: *See*—
Shuster, Nicholas; Babinsky, Andrew D.; and Kidon, William E., 4,290,864, Cl. 204-103.000.

Bachmann, Klaus J., to Bell Telephone Laboratories, Incorporated. Indium phosphide arsenide based devices. 4,291,323, Cl. 357-30.000.

Bachmann, Peter, to Ebauches Bettlach S.A. Device for securing a watch dial to a watch-movement plate. 4,291,401, Cl. 368-236.000.

Back, Paul: *See*—
Clark, Howard L.; Dorman, Richard A.; and Back, Paul, 4,291,258, Cl. 318-124.000.

Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., to Envirotech Corporation. Recovering copper from a copper-bearing source. 4,290,865, Cl. 204-106.000.

Bader, Clifford J., to Burroughs Corporation. Tracking analog-to-digital converter for AC signals. 4,291,300, Cl. 340-347.0AD.

Bagdis, Judy, to Polaroid Corporation. Sonar responsive shutter blade time out control circuit. 4,290,683, Cl. 354-234.000.

Bahl, Lalit R.; Cocke, John; Cullum, Clifton D., Jr.; and Hagenauer, Joachim, to International Business Machines Corporation. Error correction on burst channels by sequential decoding. 4,291,406, Cl. 371-44.000.

Bainbridge, Robert W.: *See*—
Dannels, W. Andrew; and Bainbridge, Robert W., 4,290,744, Cl. 425-543.000.

Baker, Gordon P.: *See*—
Smith, James E.; and Baker, Gordon P., 4,290,493, Cl. 173-124.000.

Baker International Corporation: *See*—
Beall, Clifford H.; Amancharla, Amareswar; and Luke, Michael A., 4,290,484, Cl. 166-242.000.

Bakermans, Johannes C. W.; and Neiman, Richard A., to AMP Incorporated. Cable harness assembly machine. 4,290,179, Cl. 29-33.00M.

Balchunis, Robert J.; and Bany, Stephen W., to Minnesota Mining and Manufacturing Company. Antimony halide-organic phosphate ester cationic polymerization catalysts. 4,291,145, Cl. 528-89.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Diffusion treated articles. 4,290,391, Cl. 122-511.000.

Balhouse, Harold J., to Consolidated Controls Corporation. Gate valve. 4,290,580, Cl. 251-169.000.

Ball, Russell M.; and Roberts, Robert C., to Babcock & Wilcox Company, The. Nuclear reactor safety system. 4,290,851, Cl. 176-24.000.

Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See*—
Moll, Eberhard, 4,290,614, Cl. 277-205.000.

Ban, Itsuki. Remote control device for camera. 4,290,685, Cl. 354-266.000.

Banasiak, Dennis S., to Phillips Petroleum Company. Olefin disproportionation process. 4,291,187, Cl. 585-644.000.

Baniel, Avraham M., to Yissum Research & Development Co. of Hebrew Univ. of Jeru. Process for the separation of a strong mineral acid from an aqueous solution. 4,291,007, Cl. 423-390.000.

Bany, Stephen W.: *See*—
Balchunis, Robert J.; and Bany, Stephen W., 4,291,145, Cl. 528-89.000.

Barale, Giuseppe. Shuttering system for casting concrete walls or partitions, and a method for its assembly. 4,290,985, Cl. 264-31.000.

Barantsevich, Evgeny N.: *See*—
Syrov, Anatoly A.; Ivanchev, Sergei S.; Primachenko, Oleg N.; Demidova, Valentina A.; Polozov, Boris V.; Fionov, Vladimir I.; and Barantsevich, Evgeny N., 4,290,945, Cl. 260-192.000.

Barker, Robert S., to Halcon Research and Development Corp. Preparation of propylene oxide. 4,290,959, Cl. 260-348.240.

Barnes, Alan C.; and Kay, David P., to Roussel Uclaf. Oxoimidazoquinoxalines. 4,291,033, Cl. 424-250.000.

Barnes, Howard H. Ball ejecting golf cup. 4,290,603, Cl. 273-34.00A.

Barnetche, Eduardo. Automatic wear compensating seal device. 4,290,497, Cl. 175-371.000.

Barnette, William E.: *See*—
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., 4,291,166, Cl. 549-51.000.

Baroni, James T. Eight track tape alignment instrument. 4,291,347, Cl. 360-93.000.

Barraclough, Gary O.: *See*—
McCaffrey, Craig R.; and Barraclough, Gary O., 4,291,004, Cl. 423-242.000.

Barrett, John H.; and Flynn, Brian P., to Purex Corporation. Method of producing air-permeable fabric conditioner sheet for laundry dryer. 4,291,072, Cl. 427-243.000.

Barriere, Alain. Foldable luggage carrying device. 4,290,625, Cl. 280-654.000.

Barrow, Thomas: *See*—
Owen, Harry; and Barrow, Thomas, 4,290,813, Cl. 501-13.000.

Barry, Thomas I.; Schajer, Gary S.; and Stackpool, Francis M., to Chloride Silent Power Limited. Glass seals for sealing beta-alumina in electro-chemical cells or other energy conversion devices, glasses for use in such seals and cells or other energy conversion devices with such seals. 4,291,107, Cl. 429-104.000.

Barta, Peter: *See*—
Torok, Gabor; Sarosi, Lajos; Grof, Ferenc; Becsei, Tamas; and Barta, Peter, 4,290,894, Cl. 210-661.000.

Barthe, Henry P.; and Cobb, William R., to Schroeder Brothers Corporation. Roof bolting device. 4,290,490, Cl. 173-23.000.

Barzaghi, Fernando: *See*—
Farcilli, Andre; Medici, Italo; Fournex, Robert; and Barzaghi, Fernando, 4,291,038, Cl. 424-256.000.

Basch, Walter E., to ACF Industries, Inc. Crashworthy fuel pump. 4,290,347, Cl. 92-102.000.

BASF Aktiengesellschaft: *See*—
Hambrecht, Jurgen; Lindenschmidt, Gerhard; and Regel, Walter, 4,291,134, Cl. 525-92.000.
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,291,147, Cl. 528-119.000.
Merger, Franz; and Towae, Friedrich, 4,290,970, Cl. 260-453.00P.
Ross, Karl-Heinz; Dudeck, Christian; Himmele, Walter; Lebkuecher, Rolf; and Sauer, Wolfgang, 4,290,960, Cl. 260-348.570.

Bass, David S., to Sperry Corporation. Pseudorandom number generator. 4,291,386, Cl. 364-717.000.

Batiuk, Walter: *See*—
Cornwall, Edwin P.; and Batiuk, Walter, 4,290,819, Cl. 134-3.000.

Battelle Development Corp.: *See*—
Maringer, Robert E., 4,290,993, Cl. 264-164.000.

Batteux, Jacques; Blanc, Claude; and Grancher, Pierre, to Societe Nationale Elf Aquitaine (Production). Process for the purification of residual industrial gases containing small quantities of sulfur compounds. 4,291,003, Cl. 423-228.000.

Bauer, Fritz: *See*—
Dost, Gunter; and Bauer, Fritz, 4,291,053, Cl. 424-283.000.

Bauer, Werner R., to Robertshaw Controls Company. Reversing valve construction and method of making the same. 4,290,453, Cl. 137-625.430.

Bauer, Wilfried: *See*—
Sandrin, Edmond; and Bauer, Wilfried, 4,291,022, Cl. 424-177.000.

Bauer, William J. Sludge dewatering process and vehicle for use in such process. 4,290,890, Cl. 210-608.000.

Baum, Heinz W., to Lucas Industries Limited. Disc brake pad assemblies. 4,290,508, Cl. 188-73.380.

Baum, Kurt; and Guest, Allen M., to United States of America, Navy. Esters of 2-fluoro-2,2-dinitroethylmalonate and 2,2-dinitropropylmalonate. 4,291,171, Cl. 560-156.000.

Bauman, Ludwig. Bubbler mat with separate box type mat elements. 4,290,982, Cl. 261-124.000.

Baumann, Gerald W., to International Business Machines Corporation. Carriage bin synchronization for dual mode collator. 4,290,596, Cl. 271-292.000.

Baumeister, Hans-Peter, to Eastman Kodak Company. Apparatus for checking the operational status of an electronic strobe unit's battery under load conditions. 4,290,677, Cl. 354-127.000.

Baumgartner, Pierre: *See*—
Aude, Robert; Baumgartner, Pierre; Desmarquest, Jean-Pierre; and Franck, Jean-Pierre, 4,290,973, Cl. 260-505.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Heiss, Louis R., 4,291,230, Cl. 250-458.000.

Bayer Aktiengesellschaft: *See*—
Breitenbach, Jens, 4,291,083, Cl. 428-163.000.
Heine, Hans-Georg; and Hartmann, Willy, 4,291,176, Cl. 568-381.000.
Hohlein, Peter; and Sonntag, Michael, 4,291,135, Cl. 525-101.000.
Hucks, Uwe; Wulff, Claus; Tresper, Erhard; Vernaleken, Hugo; and Selbeck, Harald, 4,290,977, Cl. 260-973.000.
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,291,044, Cl. 424-269.000.
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,291,046, Cl. 424-272.000.
Kranz, Eckart; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,291,047, Cl. 424-273.00R.
Neeff, Rutger; Kuth, Robert; Kuhnel, Werner; and Gohrbandt, Wilhelm, 4,290,768, Cl. 8-532.000.
Schroeder, Gerhard; Buxbaum, Gunter; Hund, Franz; Schopper, Heinrich-Christian; and Naumann, Rolf, 4,290,799, Cl. 75-0.50A.

Bayer, Douglas L.: *See*—
Anderson, Robert V.; Bayer, Douglas L.; Hagelbarger, David W.; and Kubik, Peter S., 4,291,198, Cl. 179-2.0DP.

Bayer, Ernst; and Kutubuddin, Mohamed, to Heyl & Co., Chemisch-Pharmazeutische Fabrik. Soluble polymerization catalysts, production of the same and their use. 4,290,918, Cl. 252-431.00R.

BBC Brown, Boveri & Company, Ltd.: *See*—
Bernasconi, Felix, 4,290,736, Cl. 417-87.000.
Dumont, Willy, 4,290,609, Cl. 277-3.000.
Skala, Karel, 4,291,378, Cl. 364-494.000.

Beach, William F.; and Mahoney, Dennis M., to Union Carbide Corporation. Electrets. 4,291,244, Cl. 307-400.000.

Beall, Clifford H.; Amancharla, Amareswar; and Luke, Michael A., to Baker International Corporation. Seal receptacle assembly. 4,290,484, Cl. 166-242.000.

Becker, William J., to Appleton Papers Inc. Adhesive composition for making form sets from carbonless copy paper sheets. 4,290,933, Cl. 260-29.6MM.

Beckman Instruments, Inc.: *See*—
Chulay, Steven J.; and Richards, Francis D., 4,290,550, Cl. 233-26.000.
Corwin, William C.; and Pawlak, Raymond M., 4,291,317, Cl. 346-140.00R.

Becsei, Tamas: *See*—
Torok, Gabor; Sarosi, Lajos; Grof, Ferenc; Becsei, Tamas; and Barta, Peter, 4,290,894, Cl. 210-661.000.

Becton, Dickinson and Company: *See*—
Percarpio, Edward P., 4,290,534, Cl. 215-247.000.

Bedell, John R.: *See*—
Smith, Robert W.; Hemmat, Naim S.; Bedell, John R.; Kavesh, Sheldon; and Draizen, Seymour, 4,290,476, Cl. 164-423.000.

Beecham Group Limited: *See*—
Brain, Edward G.; and Osborne, Neal F., 4,290,948, Cl. 260-245.20R.

Beecroft, Harold J.; and Davis, Max G., Jr., to Texas Instruments Incorporated. Optoelectronic system for determining the position of a magnetic head transducer on a flexible magnetic recording disc. 4,291,346, Cl. 360-75.000.

Behnke, Wernfried: *See*—
Pfeifer, Friedrich; and Behnke, Wernfried, 4,290,827, Cl. 148-108.000.

Behringwerke Aktiengesellschaft: *See*—
Hirsch, Wolfgang, 4,290,771, Cl. 23-230.00B.

Beierle, John W.; and Grenoble, Dale E., to Dental Concepts, Inc. Method for limiting adherence of plaque and dental composition therefor. 4,291,017, Cl. 424-52.000.

Beisch, Hanspeter E.: *See*—
Sides, Daniel H.; and Beisch, Hanspeter E., 4,290,492, Cl. 173-118.000.

Beiser, Leo. Anaglyph stereoscopy. 4,290,675, Cl. 354-112.000.

Bela, Romvari; and Gyula, Kakonyi, to Elzett Muvek. Cylindrical lock with a magnetic body. 4,290,285, Cl. 70-276.000.

Bell Telephone Laboratories, Incorporated: *See*—
Anderson, Robert V.; Bayer, Douglas L.; Hagelbarger, David W.; and Kubik, Peter S., 4,291,198, Cl. 179-2.0DP.
Bachmann, Klaus J., 4,291,323, Cl. 357-30.000.
Carbrey, Robert L., 4,291,298, Cl. 340-347.0AD.
Clemens, James T.; and Locke, Kay M., 4,291,322, Cl. 357-23.000.
Cooper, James A., Jr.; and Krambeck, Robert H., 4,291,247, Cl. 307-481.000.
Densmore, Wayne; and Quinn, Thomas M., 4,291,199, Cl. 179-18.0AB.
Jayant, Nuggehally S.; Schmidt, Carolyn E.; and Steele, Raymond, 4,291,405, Cl. 371-31.000.
Smith, Nicholas K., 4,291,200, Cl. 179-18.0BD.
Tsang, Won-Tien, 4,291,327, Cl. 357-52.000.

Bellafiore, Gaspare. Hearing aid device. 4,291,203, Cl. 179-107.00E.

Beloit Corporation: *See*—
Oas, David C., 4,290,995, Cl. 264-532.000.

Belva, George M.; and Mecklenborg, Richard A., to Singer Company, The. Optical display apparatus. 4,290,669, Cl. 350-174.000.

Benda, Rainer: *See*—
Pennewiss, Horst; Benda, Rainer; Jost, Heinz; and Knoell, Helmuth, 4,290,925, Cl. 252-56.00S.

Bendix Corporation, The: *See*—
Jackson, Robert W., 4,290,181, Cl. 29-458.000.

Benjamin Manufacturing Company, Inc.: *See*—
Benjamin, William H., 4,290,154, Cl. 4-538.000.

Benjamin, Milton L.; Miles, Wilbur N.; and Majkrzak, Edward A., to Erickson Tool Company. Tool presetting fixture. 4,290,206, Cl. 33-185.00R.

Benjamin, William H., to Benjamin Manufacturing Company, Inc. Bathtub structure. 4,290,154, Cl. 4-538.000.

Bennett, Moreland P.; and Vrabel, Edward A., to General Electric Company. Bonding a highly conductive arc-resistant electrical contact pad on a metal body. 4,291,215, Cl. 219-118.000.

Berg, Charles A., to Pyreflex Corporation. Ingot casting. 4,290,475, Cl. 164-513.000.

Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, to Rhone Poulenc Industries. Thiazolo(3,2-C)benzoxazine derivatives. 4,291,032, Cl. 424-248.510.

Berger, Fritz: *See*—
Bruckner, Georg F.; Geike, Bernd; Berger, Fritz; and Schoen, Bernd-Jurgen, 4,290,147, Cl. 2-18.000.

Berger, Isaac, to Berger, Issac. Exerciser. 4,290,599, Cl. 272-130.000.

Berger, Issac: *See*—
Berger, Isaac, 4,290,599, Cl. 272-130.000.

Bergey, Karl H., Jr.; and Bergey, Michael L. S. Windmill. 4,291,235, Cl. 290-55.000.

Bergey, Michael L. S.: *See*—
Bergey, Karl H., Jr.; and Bergey, Michael L. S., 4,291,235, Cl. 290-55.000.

Berggren, William R.; and Brownley, Shelby J., to Minnesota Mining and Manufacturing Co. Imageable, composite-dry transfer sheet and process of using same. 4,291,114, Cl. 430-253.000.

Berghof, Hans-Joachim: *See*—
Hensel, Wolfgang; Berghof, Hans-Joachim; and Werner, Heinz, 4,290,647, Cl. 297-362.000.

Bergmann, Horst, to Daimler-Benz Aktiengesellschaft. Gas-operated internal combustion engine. 4,290,402, Cl. 123-527.000.

Berlenbach, Norbert: *See*—
von Hagel, Gunter; and Berlenbach, Norbert, 4,290,898, Cl. 210-738.000.

Bernasconi, Felix, to BBC Brown, Boveri & Company, Ltd. Oil pump having a suction and pressure pipe arrangement. 4,290,736, Cl. 417-87.000.

Bernath, Gabor: *See*—
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.

Bernstein, Seymour: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,291,169, Cl. 560-45.000.

Berry, Randy: *See*—
West, Jeffery L.; and Berry, Randy, 4,290,516, Cl. 192-56.00L.

Berti, Giovanni: *See*—
Acquati, Giancarlo; Berti, Giovanni; and Fossati, Piero, 4,291,121, Cl. 435-10.000.

Bertolini, Alfio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Pharmaceutical compositions comprising trimethoprim and N-ethyl-γ-pyridone-3-carboxylic acid derivatives. 4,291,035, Cl. 424-251.000.

Bertsch, Robert J.; and Riew, Changkiu K., to B. F. Goodrich Company, The. Unsaturated polyester resins and molding compositions containing same. 4,290,939, Cl. 260-40.00R.

Bertus, Brent J.: *See*—
McKay, Dwight L.; Bertus, Brent J.; and Mark, Harold W., 4,290,919, Cl. 252-437.000.

Bettencourt, Darryl G.: *See*—
Schmidt, Lewis W.; Bettencourt, Darryl G.; Dietz, Charles F.; and Marshall, George E., Jr., 4,290,352, Cl. 100-100.000.

Betz Laboratories, Inc.: *See*—
McCaffrey, Craig R.; and Barraclough, Gary O., 4,291,004, Cl. 423-242.000.

Betz, Wolfgang; and Rossmann, Axel, to MTU Motoren-und Turbinen Union. Process for the production of high temperature-resistant metallic components with finely porous walls. 4,290,845, Cl. 156-644.000.

Beutner, Donald H.: *See*—
Files, Thomas I.; and Beutner, Donald H., 4,290,651, Cl. 299-7.000.

Bevan, William G., to General Battery Corporation. Flow control device for use with a battery formation tub. 4,290,444, Cl. 137-255.000.

Beynet, Pierre A.; and Williams, Emil K., to Standard Oil Company (Indiana). Pipeline riser for floating platforms. 4,290,715, Cl. 405-169.000.

Bhalla, Ranbir S., to Westinghouse Electric Corp. Arc discharge tube end seal. 4,291,250, Cl. 313-220.000.

Bhasin, Ram B.: *See*—
Tandon, Amar N.; and Bhasin, Ram B., 4,291,365, Cl. 362-281.000.

Bial, Wolfgang: *See*—
King, Gordon A.; Nimmo, George R.; and Bial, Wolfgang, 4,291,302, Cl. 340-642.000.

Bigall, Klaus D.: *See*—
Muehlbauer, Otto; Bigall, Klaus D.; and Roessler, Helmut, 4,291,221, Cl. 235-92.0CC.

Bihn, Daniel; and Gordon, Pat L., to Intermedics, Inc. Pacer analyzer. 4,290,430, Cl. 128-419.0PT.

Bijma, Jan; Joeres, Helmut; and Johanns, Johannes H. M., to U.S. Philips Corporation. Color display tube. 4,291,251, Cl. 313-413.000.

Binge, Derek S., to RCA Corporation. Hinge construction with positive locking means. 4,290,168, Cl. 16-175.000.

Biotronick Mess-und Therapiegerate GmbH & Co. Ingenieurburo Berlin: *See*—
Blaser, Reinhard, 4,290,429, Cl. 128-419.0PT.

Birr, Christian, to Max-Plank-Gesellschaft. Method of preparing polypeptides. 4,290,943, Cl. 260-112.50R.

Bishkin, David B., to Monsanto Company. Alkylation process improvement. 4,291,189, Cl. 585-860.000.

Bisque, Ramon E.: *See*—
MacCarthy, Patrick, 4,290,224, Cl. 46-61.000.

Bittler, Dieter: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Prezewowsky, Klaus; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,291,029, Cl. 424-238.000.

Black & Decker Inc.: *See*—
Sides, Daniel H.; and Beisch, Hanspeter E., 4,290,492, Cl. 173-118.000.

Blackwelders: *See*—
Schmidt, Lewis W.; Bettencourt, Darryl G.; Dietz, Charles F.; and Marshall, George E., Jr., 4,290,352, Cl. 100-100.000.

Blair, Joseph N., to Adams, Mamie I. Blair. Window assembly. 4,290,231, Cl. 49-173.000.

Blair, Richard H.: *See*—
McIntire, John M.; and Blair, Richard H., 4,291,131, Cl. 525-5.000.

Blanc, Claude: *See*—
Batteux, Jacques; Blanc, Claude; and Grancher, Pierre, 4,291,003, Cl. 423-228.000.

Blanton, William A., Jr., to Chevron Research Company. NO_x control in platinum-promoted complete combustion cracking catalyst regeneration. 4,290,878, Cl. 208-120.000.

Blanz, John H., to United States of America, Energy. Flexible shaft and roof drilling system. 4,290,494, Cl. 173-149.000.

Blaschke, James C.: *See*—
Smolik, John V.; Swanson, Ronald V.; Rubin, Charles P.; Blaschke, James C.; and Wagner, Roger J., 4,290,570, Cl. 244-158.00R.

Blaser, Reinhard, to Biotronick Mess-und Therapiegerate GmbH & Co. Ingenieurburo Berlin. Battery monitoring circuit in a cardiac pacemaker. 4,290,429, Cl. 128-419.0PT.

Blickensderfer, Robert, to United States of America, Interior. Sputtering apparatus for coating elongated tubes and strips. 4,290,877, Cl. 204-298.000.

Blockley, Alec G.: *See—*
McConnell, Edmund A.; Yearsley, Norman; and Blockley, Alec G., 4,290,514, Cl. 192-30.00W.

Blomqvist, Erik M.: *See—*
Blomqvist, John-Erik V.; and Blomqvist, Erik M., 4,291,195, Cl. 174-48.000.

Blomqvist, John-Erik V.; and Blomqvist, Erik M., to AB Lyckeaborgs Bruk. Lead-through for the fireproof disposition of electric cables through a wall. 4,291,195, Cl. 174-48.000.

Blount, David H. Process for the production of polyamide silicate resinous product. 4,291,154, Cl. 528-335.000.

Bocchini, Gian F.: *See—*
Apuzzo, Gennaro; and Bocchini, Gian F., 4,290,655, Cl. 308-121.000.

Boduch, Paul; and Trasavage, Robert, to W. R. Grace & Co. Relief imaging liquids. 4,291,118, Cl. 430-313.000.

Boeing Company, The: *See—*
Burton, James M.; Miller, Robert L.; and Tieden, Jansey D., 4,291,384, Cl. 364-560.000.
Cornwall, Edwin P.; and Batiuk, Walter, 4,290,819, Cl. 134-3.000.
Yoshida, Edward M., 4,290,617, Cl. 279-75.000.

Boerwinkle, Fred P.; and Kubik, Donald A., to Northern Instruments Corporation. Volatile corrosion inhibiting article. 4,290,912, Cl. 252-389.00R.

Boettcher, Charles E.: *See—*
Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,290,186, Cl. 29-576.00B.

Bogema, Edward J.; and Richards, Elmer A., to Eaton Corporation. Transmission with resilient shifting mechanism. 4,290,515, Cl. 192-53.00C.

Bohringer, Walter, to RCA Corporation. Regulated deflection circuit with start-up and electronic circuit breaker control. 4,291,257, Cl. 315-408.000.

Boiko, Georgy A.: *See—*
Medovar, Boris I.; Boiko, Georgy A.; Dubinsky, Rudolf S.; and Egorov, Sergei P., 4,290,474, Cl. 164-470.000.

Bolen, Laurance R. Foot controllable boat anchor rope locking device. 4,290,380, Cl. 114-210.000.

Bolex International SA: *See—*
Vockenhuber, Peter, 4,290,679, Cl. 354-196.000.

Boller, Hans; and Oschwald, Max. Target sight recording apparatus. 4,290,219, Cl. 42-1.00R.

Bolliger, Martin: *See—*
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, 4,290,477, Cl. 164-430.000.

Bolton, Gerald L.; Sefton, Verner B.; and Zubryckyj, Nicolaus, to Sherritt Gordon Mines Limited. Removal of manganese ions from zinc and manganese containing solutions. 4,290,866, Cl. 204-119.000.

Bonas Machine Company Limited: *See—*
Griffith, John D., 4,290,461, Cl. 139-450.000.

Bondar, Stepan E.: *See—*
Lizogub, Vadim A.; Kushnir, Alexandr P.; Figatner, Alexandr M.; and Bondar, Stepan E., 4,290,610, Cl. 277-13.000.

Bonnet, Jean L., to Schlumberger Technology Corporation. Method and apparatus for testing the integrity of the electrical insulation of a well logging sonde. 4,291,267, Cl. 324-54.000.

Boots, W. Stewart; and Altman, Jay C., to Mechanical Transplanter Company. Seedling tranplanter. 4,290,373, Cl. 111-3.000.

Borcoman, Mircea. Rotary drum plant for the manufacture of concrete, reinforced concrete and/or prestressed concrete products. 4,290,740, Cl. 425-62.000.

Borg-Warner Chemicals, Inc.: *See—*
Hechenbleikner, Ingenuin; Klicker, James D.; and Enlow, William P., 4,290,976, Cl. 260-973.000.

Borg-Warner Corporation: *See—*
Siemon, Edward C., 4,291,264, Cl. 318-729.000.
Yarema, Raymond J.; and Studtmann, George H., 4,291,368, Cl. 363-41.000.

Borner, Alfred. Apparatus for cutting foodstuffs. 4,290,196, Cl. 36-122.000.

Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, to Montedison S.p.A. Acyl anilines exerting a fungicidal action. 4,291,049, Cl. 424-275.000.

Boudakian, Max M., to Olin Corporation. Process for making 2-bromopyridine. 4,291,165, Cl. 546-345.000.

Bouillon, Claude; and Vayssie, Charles, to L'Oreal. Oxybenzylidene-bornanones, their preparation and their use in cosmetics. 4,290,974, Cl. 260-511.000.

Bova, Joseph D. Method and apparatus for making unexpanded honeycomb material. 4,290,837, Cl. 156-256.000.

Bowerman, John J.: *See—*
Spaniol, John W.; Bowerman, John J.; and Perlman, Marvin, 4,291,196, Cl. 178-3.000.

Bowman, George E.; Faust, David S.; and Kataoka, David T., to International Harvester Company. Cover for a tractor's articulation space. 4,290,623, Cl. 280-400.000.

Boyd, Robert W.: *See—*
Davis, Robert C.; and Boyd, Robert W., 4,291,277, Cl. 330-149.000.

Bra-Con Industries, Inc.: *See—*
Arthurs, John W.; and Perkowski, Ronald, 4,291,214, Cl. 219-86.100.

Braga, Albert T.; Cartier, Roger J.; Getz, Edward H.; and Hafstrom, Warren R., to Whirlpool Corporation. Power switch module. 4,291,238, Cl. 307-141.400.

Brain, Edward G.; and Osborne, Neal F., to Beecham Group Limited. Process for their preparation of β-lactam antibacterial agents. 4,290,948, Cl. 260-245.20R.

Brandes, Wilhelm: *See—*
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,291,044, Cl. 424-269.000.
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,291,046, Cl. 424-272.000.
Kranz, Eckart; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,291,047, Cl. 424-273.00R.

Brandigampola, Don E.: *See—*
Valeriote, Michael A.; Kellman, Louis C.; and Brandigampola, Don E., 4,291,284, Cl. 333-17.00M.

Branduzzi, Paolo: *See—*
Degen, Ludwig; Branduzzi, Paolo; Olivieri, Roberto; and Cimini, Nadia, 4,291,123, Cl. 435-94.000.

Brauer, Walter H.: *See—*
Triplett, William C.; and Brauer, Walter H., 4,290,498, Cl. 175-379.000.

Braun, Dietrich: *See—*
Wahlig, Helmut; Dingeldein, Elvira; and Braun, Dietrich, 4,291,013, Cl. 424-16.000.

Braun, Werner, to Messer Griesheim. Process for underwater plasma cutting of workpieces. 4,291,217, Cl. 219-121.0PH.

Brause, Joachim; Gerhard, Thomas; Keller, Manfred; and Olszok, Henry, to Waggonfabrik Uerdingen A.G. Overhead conveyor. 4,290,367, Cl. 104-105.000.

Brazdil, James F.: *See—*
Suresh, Dev D.; Brazdil, James F.; and Grasselli, Robert K., 4,290,920, Cl. 252-439.000.

Bredeweg, Roger L.; and Sitek, George J., to Leco Corporation. Method and apparatus for gas dosing for linearization. 4,290,296, Cl. 73-1.00G.

Breitenbach, Jens, to Bayer Aktiengesellschaft. Sliding barrier for furniture devices and openings in buildings. 4,291,083, Cl. 428-163.000.

Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, to Wulfing, Johann A. 7-(Oxoalkyl)-1,3-di-n-iso-propyl xanthines and their production. 4,291,037, Cl. 424-253.000.

Brewer, Given A., to United States of America, Energy. Dilatometer. 4,290,311, Cl. 73-730.000.

Brewer, Thomas D.; Purcell, Robert J.; and Sturges, James R., to Caterpillar Tractor Co. Method and apparatus for manufacturing a contoured internal diameter bushing. 4,290,236, Cl. 51-5.00A.

Brezosky, Bernard J., to General Electric Company. Movable toekick for convertible dishwasher. 4,290,660, Cl. 312-253.000.

Bricmont & Associates, Inc.: *See—*
Bricmont, Francis H., 4,290,752, Cl. 432-235.000.

Bricmont, Francis H., to Bricmont & Associates, Inc. Walking beam furnace. 4,290,752, Cl. 432-235.000.

Briggs, Aubrey C. Combination impact and pressure liquid rock drill. 4,290,496, Cl. 175-321.000.

Briggs, John A.: *See—*
Warnock, Richard B.; and Briggs, John A., 4,291,333, Cl. 358-36.000.

Briles, Wayne A. Portable security fire escape. 4,290,503, Cl. 182-47.000.

Brisco, David P., to Halliburton Company. Plug container. 4,290,482, Cl. 166-70.000.

Bristol Corporation: *See—*
Turner, Larry G., 4,290,445, Cl. 137-359.000.

British Aerospace Public Limited Company: *See—*
Haines, Derrick J., 4,290,264, Cl. 60-518.000.

British Broadcasting Corporation: *See—*
Devereux, Victor G., 4,291,331, Cl. 358-13.000.

British Chrome & Chemicals Limited: *See—*
Swales, Danvers A.; and Marshall, Michael A., 4,291,000, Cl. 423-53.000.

Brochet, Jacques, to Chimiques Ugine Kuhlmann. Method of making lactone-epoxide copolymer polyols. 4,291,155, Cl. 528-358.000.

Brockway, M. Clifford, to Liberty Glass Company. Fluid bed chemical strengthening of glass objects. 4,290,793, Cl. 65-30.140.

Brooks, Dannie L.; and Fields, Ronald S., to Reel-O-Matic Systems, Incorporated. Method and apparatus for dispensing coiled materials. 4,290,563, Cl. 242-78.600.

Brookstein, David S.; and Colcord, Alton R., to Union Carbide Corporation. Device for aligning the attenuating fiber mats. 4,290,170, Cl. 19-236.000.

Brown, Arthur D.; and Jones, Stephen G. B. Liquid surface decanter. 4,290,887, Cl. 210-242.100.

Brown, Delmont D.; and Rizza, Michael C., to D. S. Brown Company, The. Expansion joint sealing structures. 4,290,713, Cl. 404-69.000.

Brown, Jeannette E.; Rogers, Edward F.; and Graham, Donald W., to Merck & Co., Inc. Process for the preparation of traumatin. 4,290,966, Cl. 260-413.000.

Brown, Kenneth H.; and Wolma, Kenneth M., to Rust-Oleum Corporation. Method of producing silicate binders and coatings. 4,290,811, Cl. 106-1.170.

Brown, Lawrence G. Actuating system and apparatus for brakes and clutches and the like. 4,290,507, Cl. 188-24.150.

Brown, Robert O. Lobster trap game. 4,290,608, Cl. 273-256.000.

Brown, Sheldon H.: *See—*
Fletcher, Robert L.; VanLandingham, Richard D.; Brown, Sheldon H.; and Rittman, Alan H., 4,291,353, Cl. 360-128.000.
Brown, Stuart R.; Feest, Eric A.; and Leach, Fred, to United Kingdom Atomic Energy Authority. Coating of particles. 4,291,070, Cl. 427-213.000.
Browning, James S.; Pfeiler, Peter F.; and Lowery, Vernon. Surveying instrument. 4,290,207, Cl. 33-295.000.
Brownley, Shelby J.: *See—*
Berggren, William R.; and Brownley, Shelby J., 4,291,114, Cl. 430-253.000.
Bruckner, Georg F.; Geike, Bernd; Berger, Fritz; and Schoen, Bernd-Jurgen, to Metzeler Schaum GmbH. Handprotector for athletes. 4,290,147, Cl. 2-18.000.
Brunone, William T., to Champion International Corporation. Beverage carrier handle feeder and inserter. 4,290,254, Cl. 53-413.000.
Brunswick Corporation: *See—*
Erickson, Arnold R., 4,290,889, Cl. 210-484.000.
Frank, Roy W.; and Staerzl, Richard E., 4,290,394, Cl. 123-73.00A.
Brusasca, Gianfranco; and Garzulano, Gianfranco, to Rockwell-Rimoldi, S.p.A. Auxiliary transport device for sewing machines. 4,290,376, Cl. 112-121.260.
Bryant, Emerson C., to National-Standard Company. Tire building apparatus. 4,290,472, Cl. 156-416.000.
Buchanan, James E.; and Field, Marshall L., Jr., to Westinghouse Electric Corp. Analog to digital conversion weighting apparatus. 4,291,387, Cl. 364-757.000.
Buchanan, John G.; and MacBean, Donald G., to Jwi Ltd. Dryer fabric. 4,290,209, Cl. 34-123.000.
Buchel, Karl H.: *See—*
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,291,044, Cl. 424-269.000.
Kranz, Eckart; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,291,047, Cl. 424-273.00R.
Buchner, Helmut, to Daimler-Benz Aktiengesellschaft. Method for recouping combustion heat. 4,290,267, Cl. 60-648.000.
Buck, Daniel C., to Westinghouse Electric Corp. Microwave combiner assembly. 4,291,279, Cl. 330-287.000.
Budd Company, The: *See—*
Hulse, David O., 4,290,509, Cl. 188-181.00A.
Jahnle, Herbert A.; and Freeman, Richard B., 4,290,235, Cl. 49-502.000.
Budzich, Tadeusz. Load responsive control valve. 4,290,448, Cl. 137-596.130.
Budzich, Tadeusz. Load responsive control valve. 4,290,449, Cl. 137-596.130.
Buettel, Paul M. Web splicing method. 4,290,834, Cl. 156-157.000.
Buhler, Marcel; Olofsson, Mats; and Fosseux, Pierre-Yves, to Societe d'Assistance Technique pour Produits Nestle S.A. Whey protein recovery. 4,291,067, Cl. 426-582.000.
Bui, Tren V. Lamp socket switch operator extension. 4,291,212, Cl. 200-331.000.
Bujan, Albert F., to Abbott Laboratories. Intravenous pump chamber. 4,290,346, Cl. 92-90.000.
Bull Dog Lock Co.: *See—*
Waller, Arthur, 4,290,710, Cl. 403-306.000.
Bunker Ramo Corporation: *See—*
Storcel, Joseph A., 4,290,662, Cl. 339-89.00M.
Buntschuh, Charles D., to Microwave Associates, Inc. Microwave integrated circuit double balanced mixer. 4,291,415, Cl. 455-328.000.
Burke, Barry E.: *See—*
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,291,390, Cl. 365-183.000.
Burkert GmbH: *See—*
Dettmann, Heinrich; and Pfeiffer, Wolfgang, 4,291,358, Cl. 361-154.000.
Burns, Alonzo M., Jr.; Silliman, Jeffrey E.; Gilbert, Woodrow P.; and Pascoe, William M., Sr., to Milliken Research Corporation. Chemically sculpturing acrylic fabrics and process for preparing same. 4,290,766, Cl. 8-491.000.
Burns, Edgar, to International Telephone and Telegraph Corporation. Programmable electrical connector. 4,290,661, Cl. 339-18.00R.
Burns, Richard D., to General Electric Company. Apparatus for making dynamoelectric machine stators. 4,290,291, Cl. 72-316.000.
Burroughs Corporation: *See—*
Bader, Clifford J., 4,291,300, Cl. 340-347.0AD.
Forbes, Brian K.; and Catiller, Robert D., 4,291,372, Cl. 364-200.000.
Nelson, Edward I., 4,291,225, Cl. 250-229.000.
Ragle, Herbert U.; and DeMoss, Dean, 4,291,349, Cl. 360-98.000.
Burton, Charles V. Surgical headlight system. 4,290,422, Cl. 128-23.000.
Burton, Gary B. Knot retainer for shoelaces. 4,290,172, Cl. 24-117.000.
Burton, James M.; Miller, Robert L.; and Tieden, Jansey D., to Boeing Company, The. Tape gauge system. 4,291,384, Cl. 364-560.000.
Burwen, Richard S.: *See—*
Herbert, Normand C.; Burwen, Richard S.; and Mentelos, Richard A., 4,290,431, Cl. 128-635.000.
Bussiere, Jean F.; Welch, David O.; and Suenaga, Masaki, to United States of America, Energy. Bimetallic strip for low temperature use. 4,291,105, Cl. 428-616.000.
Bussing, Jurgen: *See—*
Wirth, Hermann O.; Bussing, Jurgen; and Friedrich, Hans-Helmut, 4,290,940, Cl. 260-45.80N.
Butler Greenwich Inc.: *See—*
Kapoor, Vinod, 4,290,359, Cl. 101-148.000.
Buxbaum, Gunter: *See—*
Schroeder, Gerhard; Buxbaum, Gunter; Hund, Franz; Schopper, Heinrich-Christian; and Naumann, Rolf, 4,290,799, Cl. 75-0.50A.
Buxton, Samuel R.: *See—*
Campbell, David O.; and Buxton, Samuel R., 4,290,967, Cl. 260-429.00R.
C. Mayo, Inc.: *See—*
Mayo, Carlos, 4,290,409, Cl. 126-121.000.
Cabrera, Armando N., to Investigacion Fic Fideicomiso. Neck ring assembly for automatic blow molding machines. 4,290,795, Cl. 65-260.000.
Caithness, Michael G.: *See—*
Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., 4,291,208, Cl. 200-148.00A.
Caldwell, John T.; Fehlau, Paul E.; and France, Stephen W., to United States of America, Energy. Rapid scanning system for fuel drawers. 4,291,227, Cl. 250-328.000.
Call, James. Apparatus for collecting market survey data from universal product type coded items. 4,290,688, Cl. 355-1.000.
Cam Gears Limited: *See—*
Adams, Frederick J., 4,290,344, Cl. 91-467.000.
Camaggi, Giovanni: *See—*
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.
Campagnolo, Tullio. Fixture for special gears, particularly of bicycles. 4,290,180, Cl. 29-240.000.
Campbell, Charles A.: *See—*
Wynosky, Thomas A.; Campbell, Charles A.; and Mischke, Robert J., 4,290,262, Cl. 60-262.000.
Campbell, David O.; and Buxton, Samuel R., to United States of America, Energy. Process for recovery of palladium from nuclear fuel reprocessing wastes. 4,290,967, Cl. 260-429.00R.
Campbell, Frank, Jr. Truncated triangular insulator. 4,290,457, Cl. 138-149.000.
Camus, Annamaria: *See—*
Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,290,961, Cl. 260-397.400.
Canadian General Electric Company Limited: *See—*
Quant, Tony, 4,291,360, Cl. 361-189.000.
Stevenson, Andrew C.; Herzog, Gordon W.; and Murdoch, James C., 4,291,263, Cl. 318-706.000.
Canon Kabushiki Kaisha: *See—*
Saito, Syuichiro; Uchiyama, Takashi; and Yoshida, Syozo, 4,290,682, Cl. 354-234.000.
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,291,223, Cl. 250-201.000.
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,290,686, Cl. 354-289.000.
Caples, Edgar L.; Marston, Robert K.; and Massad, Khalil E., to Rockwell International Corporation. Multipath diversity spread spectrum receiver. 4,291,410, Cl. 375-1.000.
Cappelletto, Renzo; and Willame, Jean. Method and an installation for regenerating molding sands. 4,291,379, Cl. 364-506.000.
Capriotti, Alfred J., to United States Steel Corporation. Spacial alignment method for rolling mill rolls and chocks. 4,290,289, Cl. 72-31.000.
Carbrey, Robert L., to Bell Telephone Laboratories, Incorporated. Reversible analog to digital converter with high precision. 4,291,298, Cl. 340-347.0AD.
Carco Accessories Limited: *See—*
Johnstone, Frank, 4,290,551, Cl. 236-9.00R.
Cardone, Joseph T.; and Shatz, Kenneth J. Liquid powered, closed loop power generating system and process for using same. 4,291,232, Cl. 290-1.00R.
Carinalli, Charles P., to National Semiconductor Corporation. Open base bipolar transistor protective device. 4,291,319, Cl. 357-13.000.
Carl Still, Firma: *See—*
Strobel, Manfred; and Thiersch, Friedrich, both of, 4,290,854, Cl. 201-26.000.
Carlingswitch, Inc.: *See—*
Discenza, Frank J., 4,291,211, Cl. 200-311.000.
Carlson, David H. J., to UOP Inc. Catalytic composite, method of manufacture, and process for use. 4,290,916, Cl. 252-430.000.
Carlson, David H. J., to UOP Inc. Method of manufacturing a catalytic composite. 4,290,917, Cl. 252-430.000.
Carrison, Craig L.: *See—*
Hamilton, James M.; and Carrison, Craig L., 4,291,243, Cl. 307-304.000.
Carson Alexiou Corporation: *See—*
Rotolante, Ralph A.; and Koehler, Toivo, 4,290,844, Cl. 156-630.000.
Carter, Festus A. Suppression of surface foam on detergent-contaminated lagoons. 4,290,379, Cl. 114-26.000.
Cartier, Roger J.: *See—*
Braga, Albert T.; Cartier, Roger J.; Getz, Edward H.; and Hafstrom, Warren R., 4,291,238, Cl. 307-141.400.
Carus Corporation: *See—*
Mein, Peter G.; and Reidies, Arno H., 4,290,923, Cl. 252-462.000.
Carver, Joseph. Sucrose density gradient system. 4,290,300, Cl. 73-32.00R.
Cary, Arthur P. Angular detachable extensions to the forks of fork lift trucks. 4,290,729, Cl. 414-607.000.

Casals-Stenzel, Jorge: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Prezewowsky, Klaus; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,291,029, Cl. 424-238.000.

Casey, Martin J.; Stein, Barry F.; and Wetterskog, Herman E., to Sperry Corporation. Bubble memory optimization by adjusting properties of quartz film. 4,291,091, Cl. 428-336.000.

Casimir Kast GmbH & Co. KG: *See*—
Nopper, Herbert; and Knoch, Wolfgang, 4,290,988, Cl. 264-112.000.

Castera, Jean P., to Thomson-CSF. Single-mode tunable oscillator using magnetostatic waves. 4,291,283, Cl. 331-96.000.

Castro, Carlos A.: *See*—
Korenstein, Ralph; and Castro, Carlos A., 4,290,843, Cl. 156-628.000.

Caterpillar Tractor Co.: *See*—
Brewer, Thomas D.; Purcell, Robert J.; and Sturges, James R., 4,290,236, Cl. 51-5.00A.
Kizer, Richard W.; Anderson, Arlynn W.; and Untz, Robert W., 4,290,990, Cl. 264-156.000.
Stepe, Visvaldis A., 4,290,214, Cl. 37-141.00T.

Catiller, Robert D.: *See*—
Forbes, Brian K.; and Catiller, Robert D., 4,291,372, Cl. 364-200.000.

Cebalo, Tony; and Walde, Robert A., to Air Products and Chemicals, Inc. Herbicidal compound and method of use. 4,290,798, Cl. 71-90.000.

Celanese Corporation: *See*—
Soehngen, John W.; and Chen, John C., 4,290,987, Cl. 264-41.000.

Centro Ricerche Fiat S.p.A.: *See*—
Milana, Emilio, 4,290,698, Cl. 356-371.000.

Chambers, William J., to Du Pont de Nemours, E. I., and Company. Elements and method which use photopolymerizable compositions based on salt-forming polymers and polyhydroxy polyethers. 4,291,115, Cl. 430-271.000.

Champion International Corporation: *See*—
Brunone, William T., 4,290,254, Cl. 53-413.000.
Sullivan, John; and Lillibridge, Harold R., 4,290,547, Cl. 229-77.000.

Chan, Han-Saw. Reminder alarm system for preventing mislaying of personal articles. 4,291,301, Cl. 340-568.000.

Chan, Tsiu C.: *See*—
McKenny, Vernon G.; and Chan, Tsiu C., 4,290,185, Cl. 29-571.000.

Charlebois, Thomas F.; and Roswog, Edward J., to General Electric Company. Diagnostic ultrasound apparatus having automatic isocentric rotator. 4,290,309, Cl. 73-621.000.

Charles, Larry L., to Westinghouse Electric Corp. Core memory interface for coupling a processor to a memory having a differing word length. 4,291,370, Cl. 364-200.000.

Charpentier, Jean, to Sietam S.A. Device for cleaning mechanical parts. 4,290,439, Cl. 134-107.000.

Chase, James P., to Ampex Corporation. Extended life multichannel magnetic transducer. 4,291,354, Cl. 360-129.000.

Chase, Kenneth P.; and McCoy, Dale E., to Owens-Corning Fiberglass Corporation. Coating composition for glass fibers. 4,291,095, Cl. 428-391.000.

Chase, Wendell D., to United States of America, National Aeronautics and Space Administration. Spectrally balanced chromatic landing approach lighting system. 4,291,294, Cl. 340-26.000.

Chatterjee, Pallab K.; and Taylor, Geoffrey W., to Texas Instruments Incorporated. Taper isolated random access memory array and method of operating. 4,291,391, Cl. 365-184.000.

Chen, Albert C., to Mobil Oil Corporation. Insecticidal phenoxy hydroxamates. 4,291,055, Cl. 424-298.000.

Chen, John C.: *See*—
Soehngen, John W.; and Chen, John C., 4,290,987, Cl. 264-41.000.

Cheng, Jiin-Duey, to Du Pont de Nemours, E. I., and Company. Insecticidal carbamoyl sulfides. 4,291,054, Cl. 424-298.000.

Cherry, Peter C.; Newall, Christopher E.; Watson, Nigel S.; Gregory, Gordon I.; and Ward, Peter, to Glaxo Operations UK Limited. Esters of 2-vinylclav-2-em-3-carboxylic acid and process for preparing same. 4,290,949, Cl. 260-245.300.

Chevron Research Company: *See*—
Blanton, William A., Jr., 4,290,878, Cl. 208-120.000.

Chi-Jung, Lo. Volume and temperature indicators for insulated air pot. 4,290,537, Cl. 222-25.000.

Chiba, Toshiyuki: *See*—
Takaya, Takao; and Chiba, Toshiyuki, 4,291,031, Cl. 424-246.000.

Chika, John J. Structure to couple two bicycles. 4,290,620, Cl. 280-209.000.

Chimiques Ugine Kuhlmann: *See*—
Brochet, Jacques, 4,291,155, Cl. 528-358.000.

Chin, Albert K., to Fogarty, Thomas J. Endarterectomy apparatus. 4,290,427, Cl. 128-304.000.

Chino, Koichi: *See*—
Horiuchi, Susumu; Hirano, Mikio; Yusa, Hideo; Chino, Koichi; and Hayashi, Tatsuo, 4,290,907, Cl. 252-301.10W.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.

Chisso Engineering Co.Ltd.: *See*—
Hayashi, Kohtaro; Morihara, Ko; and Nakamura, Kohji, 4,290,996, Cl. 264-564.000.

Chiu, Te-Long: *See*—
Lien, Jih-Chang; and Chiu, Te-Long, 4,291,328, Cl. 357-59.000.

Chloride Silent Power Limited: *See*—
Barry, Thomas I.; Schajer, Gary S.; and Stackpool, Francis M., 4,291,107, Cl. 429-104.000.

Chown, Martin, to International Standard Electric Corporation. Optical fibre terminations and connectors. 4,290,667, Cl. 350-96.180.

Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzman, Thomas N., to Merck & Co., Inc. Process for the preparation of thienamycin and intermediates. 4,290,947, Cl. 260-239.00A.

Chrysler Corporation: *See*—
Warren, Richard J., 4,290,510, Cl. 188-218.0XL.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.

Chulay, Steven J.; and Richards, Francis D., to Beckman Instruments, Inc. Modular supporting cap and spacer for centrifuge tubes. 4,290,550, Cl. 233-26.000.

Ciba-Geigy Corporation: *See*—
Abel, Heinz, 4,290,767, Cl. 8-496.000.
Elmore, Charles E.; and Harmon, David H., 4,291,128, Cl. 521-54.000.
Haug, Theobald, 4,291,146, Cl. 528-119.000.
Kristiansen, Odd; and Drabek, Jozef, 4,291,043, Cl. 424-269.000.
Massy, Derek J. R., 4,291,162, Cl. 544-199.000.
Meyer, Willy; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; and Karrer, Friedrich, 4,291,056, Cl. 424-304.000.
Muntwyler, Rene, 4,290,846, Cl. 162-161.000.
Reinehr, Dieter; and Lienhard, Paul, 4,290,964, Cl. 260-404.000.
Schneider, Rainer; and Abeler, Gerd, 4,290,942, Cl. 260-45.85H.
Sturm, Elmar; and Nyfeler, Robert, 4,291,061, Cl. 424-331.000.
Wirth, Hermann O.; Bussing, Jurgen; and Friedrich, Hans-Helmut, 4,290,940, Cl. 260-45.80N.
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, 4,290,941, Cl. 260-45.85B.

Cimini, Nadia: *See*—
Degen, Ludwig; Branduzzi, Paolo; Olivieri, Roberto; and Cimini, Nadia, 4,291,123, Cl. 435-94.000.

Cincotta, Louis; and Foley, James W., to Polaroid Corporation. 3,6-Di(alkyl/phenyl)amino-9-carboxamidophenyl-xanthenes. 4,290,955, Cl. 260-336.000.

Citizen Watch Co. Ltd.: *See*—
Komiyama, Katsuhiko; and Hiruta, Toshio, 4,291,400, Cl. 368-84.000.
Nakajima, Koichi; and Tsuchiya, Hidetaka, 4,291,402, Cl. 368-276.000.

Claassens, Johannes E. L.: *See*—
Schaafsma, Sijbrandus E.; Hofman, Johannes H. A.; and Claassens, Johannes E. L., 4,291,170, Cl. 560-126.000.

Clamor Company: *See*—
Morton, John C., 4,290,618, Cl. 280-5.220.

Clark, Clyde C., to Vermont American Corp. Ratchet handle. 4,290,328, Cl. 81-62.000.

Clark, Howard L.; Dorman, Richard A.; and Back, Paul, to Mechanical Technology Incorporated. DC Excitation control for linear oscillating motors. 4,291,258, Cl. 318-124.000.

Clark, Steven J. Apparatus for generating electricity. 4,291,234, Cl. 290-53.000.

Clarke, Raymond: *See*—
Ellis, Roger H.; and Clarke, Raymond, 4,290,668, Cl. 350-96.200.

Clay, Bobby J., to Natmar, Inc. Independently operable multihead endless band printer. 4,290,357, Cl. 101-111.000.

Clay, Tymen. Ram type pump. 4,290,737, Cl. 417-403.000.

Clegg, Maurice A., to Sherritt Gordon Mines Limited. Process for the production of cobalt-rare earth alloy powders. 4,290,826, Cl. 148-101.000.

Clemens, James T.; and Locke, Kay M., to Bell Telephone Laboratories, Incorporated. Structure for shallow junction MOS circuits. 4,291,322, Cl. 357-23.000.

Clevepak Corporation: *See*—
Mandt, Mikkel G., 4,290,884, Cl. 210-195.300.

Clifford, Michael L., to Imperial Chemical Industries Limited. Polymerization process. 4,291,132, Cl. 525-53.000.

Clow Corporation: *See*—
McPherson, Alex L.; Triestram, Douglas E.; and Lawrence, James E., Jr., 4,290,836, Cl. 156-171.000.

CMI Corporation: *See*—
Swisher, George W., Jr.; Steele, Thomas L.; and Silbernagle, Richard A., 4,290,820, Cl. 134-6.000.

Cobar Resources, Inc.: *See*—
Cole, Hugh F., 4,290,824, Cl. 148-23.000.

Cobb, William R.: *See*—
Barthe, Henry P.; and Cobb, William R., 4,290,490, Cl. 173-23.000.

Coburn, Robert E.; Gabriel, Ronald M.; and Tuthill, Richard S., to United Technologies Corporation. Fuel nozzle with water injection. 4,290,558, Cl. 239-400.000.

Coccia, Larry A., to Pullman Incorporated. Ore treating apparatus. 4,290,587, Cl. 266-191.000.

Cocke, John: *See*—
Bahl, Lalit R.; Cocke, John; Cullum, Clifton D., Jr.; and Hagenauer, Joachim, 4,291,406, Cl. 371-44.000.

Coe, Merlin D.: *See*—
Arnold, Donald S.; Fairchild, James L.; Nichols, Donald A.; and Coe, Merlin D., 4,291,002, Cl. 423-189.000.

Cohen, Stuart C., to General Electric Company. Thermoplastic molding compositions. 4,290,937, Cl. 260-40.00R.

Colcord, Alton R.: *See—*
Brookstein, David S.; and Colcord, Alton R., 4,290,170, Cl. 19-236.000.

Cole, Hugh F., to Cobar Resources, Inc. Water soluble rosin flux. 4,290,824, Cl. 148-23.000.

Collins, Edward J., to General Electric Company. Photoflash lamp array circuit board having radiation sensitive fuse elements. 4,290,747, Cl. 431-359.000.

Collins, Edward J.; and Lenkner, William A., to General Electric Company. Photoflash lamp array circuit board having radiation sensitive fuse elements. 4,290,748, Cl. 431-359.000.

Colombo, Piero. Drawing and straightening machine for use in continuous casting plants. 4,290,479, Cl. 164-448.000.

Combustion Engineering, Inc.: *See—*
Palchik, David, 4,290,389, Cl. 122-406.00S.

Commissariat a l'Energie Atomique: *See—*
Maupre, Jean-Pierre; and Trouve, Jean, 4,290,822, Cl. 134-19.000.

Communications Systems, Inc.: *See—*
Davis, Robert W.; and Tracy, Paul D., 4,290,664, Cl. 339-156.00R.

Compagnie Generale pour les Developpements Operationnels des Richesses sous Marines "C. G. Doris": *See—*
Lamy, Jacques E., 4,290,716, Cl. 405-203.000.

Compagnie Universelle D'Acetylene et D'Electro-Metallurgie: *See—*
Gorgerino, Mario; and Videau, Daniel, 4,290,805, Cl. 75-130.00R.

Compret N.V.: *See—*
Kolbel, Gert F., 4,290,600, Cl. 272-137.000.

Conoco Inc.: *See—*
Dudt, Philip J., 4,290,780, Cl. 48-210.000.
Leach, Bruce E., 4,290,924, Cl. 252-469.000.

Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Substituted naphthoic acids. 4,291,169, Cl. 560-45.000.

Consolidated Controls Corporation: *See—*
Balhouse, Harold J., 4,290,580, Cl. 251-169.000.

Consolidated Edison Company of New York, Inc.: *See—*
Eccleston, Thomas F.; and Wilson, Walter M., 4,291,192, Cl. 174-11.0BH.

Conti, Hugo; and Drelicharz, Joseph A. Connector receiver for pontoon causeways. 4,290,382, Cl. 114-266.000.

Contraves AG: *See—*
Frey, Raymond, 4,290,772, Cl. 23-230.00B.

Control Data Corporation: *See—*
Toth, Dolan H., 4,291,389, Cl. 365-15.000.

Cook Paint and Varnish Company: *See—*
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,290,932, Cl. 260-29.6WB.

Cook, Richard B.; and Witt, Henry J., to FMC Corporation. Agarose composition, aqueous gel and method of making same. 4,290,911, Cl. 252-316.000.

Cooper Industries, Inc.: *See—*
Mayer, James R., 4,290,491, Cl. 173-43.000.

Cooper, James A., Jr.; and Krambeck, Robert H., to Bell Telephone Laboratories, Incorporated. Multistage logic circuit arrangement. 4,291,247, Cl. 307-481.000.

Coppa, Anthony P., to General Electric Co. Method of fabricating a low cost diagonal type MHD generator channel frame element. 4,290,189, Cl. 29-596.000.

Cornell Research Foundation, Inc.: *See—*
Sudan, Ravindra N., 4,290,848, Cl. 176-5.000.

Corning Glass Works: *See—*
Kane, William T.; and Whitney, William P., II, 4,290,586, Cl. 266-80.000.
Wedding, Brent M., 4,290,794, Cl. 65-30.110.

Cornwall, Edwin P.; and Batiuk, Walter, to Boeing Company, The. Method and composition for the removal of phenolic resin coatings from aluminum. 4,290,819, Cl. 134-3.000.

Corwin, William C.; and Pawlak, Raymond M., to Beckman Instruments, Inc. Inking system for multi-pen recorders. 4,291,317, Cl. 346-140.00R.

Cosby, Phillip A., to Graham Magnetics, Inc. Tape cartridge strap cleaning method. 4,290,821, Cl. 134-8.000.

Cournoyer, Richard L.; and Foley, James W., to Polaroid Corporation. Sulfo-substituted-3,6-di(N-indolinyl)-9-sulfonamidophenyl-xanthenes. 4,290,950, Cl. 260-326.12R.

Cowley, Gerald: *See—*
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CPC International Inc.: *See—*
Zobel, Henry F.; and Maxwell, James L., 4,291,065, Cl. 426-549.000.

Cragoe, Edward J., Jr.: *See—*
Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., 4,291,050, Cl. 424-278.000.

Crane Packing Co.: *See—*
Sedy, Josef, 4,290,611, Cl. 277-27.000.

Creative Anglers: *See—*
Ostenberg, John R.; and Ligas, Kenneth M., 4,290,223, Cl. 43-54.50R.

Creative Craftsmen, Inc.: *See—*
Pfender, Thomas E., 4,290,383, Cl. 118-630.000.

Crehan, Patrick James.: *See—*
Kennedy, Richard B., 4,291,129, Cl. 521-103.000.

Crick, Robert G. Fault locating system for electric cables and the like. 4,291,204, Cl. 179-175.30F.

Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., to Westinghouse Electric Corp.; and Northern Engineering Industries Ltd. Gas-insulated circuit-interrupter having improved insulating nozzle. 4,291,208, Cl. 200-148.00A.

Cronson, Harry M.: *See—*
Rao, Basrur R.; Ross, Gerald F.; and Cronson, Harry M., 4,291,289, Cl. 333-240.000.

Crosby, Guy A.: *See—*
Du Bois, Grant E.; Stephenson, Rebecca A. G.; and Crosby, Guy A., 4,290,957, Cl. 260-345.200.

Crozzoli, Gualtiero. Flexible tube liquid transfer device. 4,290,443, Cl. 137-147.000.

Crum, Glen F.; and Paton, Samuel J., to El Paso Products Company. Production of tertiary-butylstyrene. 4,291,183, Cl. 585-443.000.

Crum, Glen F.; and Paton, Samuel J., to El Paso Products Company. Process for producing tertiary-butylstyrene. 4,291,184, Cl. 585-443.000.

Csengeri, George. Ventilating outsole. 4,290,211, Cl. 36-3.00B.

Cuba, Cary. Tree-mounted deer stand. 4,290,504, Cl. 182-187.000.

Cullum, Clifton D., Jr.: *See—*
Bahl, Lalit R.; Cocke, John; Cullum, Clifton D., Jr.; and Hagenauer, Joachim, 4,291,406, Cl. 371-44.000.

Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., to General Motors Corporation. L-shaped inflatable restraint cushion. 4,290,627, Cl. 280-729.000.

Curtiss-Wright Corporation: *See—*
De Feo, Angelo; and Hosek, William, 4,290,387, Cl. 122-4.00D.

Cutler, Scott E.; and Eichelberger, Charles W., to General Electric Company. Touch pad and display tube circuitry. 4,291,303, Cl. 340-711.000.

Czenkusch, Edward L., to Phillips Petroleum Co. Regeneration of ferric ions in coal desulfurization process. 4,290,777, Cl. 44-1.0SR.

D. S. Brown Company, The: *See—*
Brown, Delmont D.; and Rizza, Michael C., 4,290,713, Cl. 404-69.000.

Dahlberg, Reinhard, to Licentia Patent-Verwaltungs G.m.b.H. Solar cell arrangement. 4,291,191, Cl. 136-246.000.

Daimler-Benz Aktiengesellschaft: *See—*
Bergmann, Horst, 4,290,402, Cl. 123-527.000.
Buchner, Helmut, 4,290,267, Cl. 60-648.000.
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,290,397, Cl. 123-195.00A.

Dale, John M.: *See—*
Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., 4,290,816, Cl. 106-287.320.

Dalton, Gerald P. External cover for an automobile roof having a movable panel. 4,290,640, Cl. 296-95.00R.

Damron, Eugene: *See—*
Woodall, Robert M.; Damron, Eugene; and Mick, Martin B., 4,290,879, Cl. 208-232.000.

Damron, William M. Archery guiding device for archery bow. 4,290,407, Cl. 124-41.00A.

Danfoss A/S: *See—*
Molgaard, Aage; and Graversen, Niels P. G., 4,290,553, Cl. 236-42.000.

Daniels, Larry K., deceased; and Daniels, Patricia K., administratrix. Rotary brush. 4,290,160, Cl. 15-29.000.

Daniels, Patricia K., administratrix: *See—*
Daniels, Larry K., deceased; and Daniels, Patricia K., administratrix, 4,290,160, Cl. 15-29.000.

Daniels, Stephen, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Decompression bubble detectors. 4,290,432, Cl. 128-660.000.

Dann, Murray: *See—*
Tobkes, Martin; Dann, Murray; Klothen, Irving; Spicer, Larry D.; and Williams, David R., 4,291,026, Cl. 424-181.000.

Dannels, W. Andrew; and Bainbridge, Robert W., to Hooker Chemicals & Plastics Corp. Apparatus for runnerless injection-compression molding thermosetting materials. 4,290,744, Cl. 425-543.000.

Dau, Gary J., to Electric Power Research Institute, Inc. Method of monitoring defects in tubular products. 4,290,308, Cl. 73-602.000.

Daugherty, Thomas L., to United States of America, Navy. Hydrodynamic bearing with extended pressure gradient. 4,290,656, Cl. 308-121.000.

Dausseing, Jean-Paul: *See—*
Fish, Aaron M.; and Dausseing, Jean-Paul, 4,290,279, Cl. 70-38.00A.

Dautzenberg, Frits M.; and Wagstaff, Nigel, to Shell Oil Company. Process for the preparation of aromatic hydrocarbons and hydrogen from butane. 4,291,182, Cl. 585-415.000.

Davey, Joseph A. Bicycles. 4,290,621, Cl. 280-216.000.

Davis, Max G., Jr.: *See—*
Beecroft, Harold J.; and Davis, Max G., Jr., 4,291,346, Cl. 360-75.000.

Davis, Robert C.; and Boyd, Robert W., to Harris Corporation. Adaptive predistortion technique for linearizing a power amplifier for digital data systems. 4,291,277, Cl. 330-149.000.

Davis, Robert W.; and Tracy, Paul D., to Communications Systems, Inc. Multiple outlet telephone line adapter. 4,290,664, Cl. 339-156.00R.

Davis, William E., Sr. Harvesting device. 4,290,727, Cl. 414-508.000.

Davy Powergas Inc.: *See—*
Dempsey, John P., 4,290,882, Cl. 210-634.000.

Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., to United Kingdom Atomic Energy Authority. Semiconductor devices con-

taining protons and deuterons implanted regions. 4,290,825, Cl. 148-33.400.
de Baan, Johannes J.; and Adrian, Adolf, to August Bilstein, Firma. Load-carrying strut construction. 4,290,511, Cl. 188-322.170.
DeBano, John: *See*—
Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., 4,290,627, Cl. 280-729.000.
Deborde, Albert H., to Saurer-Diederichs. Active auxiliary nozzle for a shuttle-less loom with pneumatic weft insertion. 4,290,460, Cl. 139-435.000.
DeCarlo, Vincent J.; Powers, Robert W.; and Mitoff, Stephan P., to General Electric Company. Production of β-alumina ceramic tubes. 4,291,108, Cl. 429-193.000.
Decca Limited: *See*—
Spiller, Basil H. R.; and Pratt, Allan F., 4,291,309, Cl. 343-7.500.
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., to Auburn International, Inc. Flow regime detecting. 4,291,273, Cl. 324-343.000.
Deere & Company: *See*—
Felland, Richard A.; and Miller, James A., 4,291,213, Cl. 200-335.000.
De Feo, Angelo; and Hosek, William, to Curtiss-Wright Corporation. Fluidized bed combustor and tube construction therefor. 4,290,387, Cl. 122-4.00D.
Degawa, Yoshio: *See*—
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.
Degen, Ludwig; Branduzzi, Paolo; Olivieri, Roberto; and Cimini, Nadia, to Snamprogetti, S.p.A. Production of fructose and fructose-base syrups and means for carrying out such production. 4,291,123, Cl. 435-94.000.
DeGeorge, Bernard J.; Hermanson, Dean E.; and Tomas, Carlos, to Youngstown Sheet and Tube Company. Loading arm. 4,290,463, Cl. 141-387.000.
del ser Gonzalez, Clemente. Machines for pitting and stuffing olives. 4,290,350, Cl. 99-494.000.
De Maria, Carmine. Demountable window construction. 4,290,234, Cl. 49-415.000.
Demidova, Valentina A.: *See*—
Syrov, Anatoly A.; Ivanchev, Sergei S.; Primachenko, Oleg N.; Demidova, Valentina A.; Polozov, Boris V.; Fionov, Vladimir I.; and Barantsevich, Evgeny N., 4,290,945, Cl. 260-192.000.
Demirel, Turgut; and Handy, Richard L., to Iowa State University Research Foundation, Inc. Basement waterproofing system. 4,290,252, Cl. 52-742.000.
DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,291,349, Cl. 360-98.000.
Dempsey, John P., to Davy Powergas Inc. Electrostatic separation of impurities phase from liquid-liquid extraction. 4,290,882, Cl. 210-634.000.
de Muinck, Andre R., to Johns-Manville Corporation. Perlite expansion process and apparatus therefor. 4,290,749, Cl. 432-13.000.
Denhart, Norbert J., to Elm Window Co. High security tamper-proof mailbox. 4,290,548, Cl. 232-24.000.
Densmore, Wayne; and Quinn, Thomas M., to Bell Telephone Laboratories, Incorporated. Communication system tracking arrangement. 4,291,199, Cl. 179-18.0AB.
Dental Concepts, Inc.: *See*—
Beierle, John W.; and Grenoble, Dale E., 4,291,017, Cl. 424-52.000.
De Rosa, Dennis. Drawer file cabinet. 4,290,658, Cl. 312-108.000.
Desmarquest, Jean-Pierre: *See*—
Aude, Robert; Baumgartner, Pierre; Desmarquest, Jean-Pierre; and Franck, Jean-Pierre, 4,290,973, Cl. 260-505.00R.
Dettmann, Heinrich; and Pfeiffer, Wolfgang, to Burkert GmbH. Magnetic valve with electronic control. 4,291,358, Cl. 361-154.000.
Deutsche Texaco Aktiengesellschaft: *See*—
Dielacher, Maximillian; and Hansen, Uwe, 4,290,881, Cl. 208-310.00R.
Devereux, Victor G., to British Broadcasting Corporation. Digital processing of N.T.S.C. color television signals. 4,291,331, Cl. 358-13.000.
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Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.
Dewey, Lloyd P.: *See*—
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Diamond International Corporation: *See*—
Harvey, Albert J., 4,290,519, Cl. 198-483.000.
Diamond Shamrock Corporation: *See*—
Shuster, Nicholas; Babinsky, Andrew D.; and Kidon, William E., 4,290,864, Cl. 204-103.000.
Villa, Jose L.; Sinka, Joseph V.; and Fleming, Joseph P., 4,290,817, Cl. 106-315.000.
Dick, Peter D.; and Cowley, Gerald, to Erco Industries Limited. Washing apparatus in chlorine dioxide production. 4,290,998, Cl. 422-193.000.
Didier-Werke AG.: *See*—
Luhrsen, Ernst; and Schermer, Heinz, 4,290,589, Cl. 266-236.000.
Diebold, James L.: *See*—
Freed, Meier E.; and Diebold, James L., 4,290,952, Cl. 260-326.470.
Dielacher, Maximillian; and Hansen, Uwe, to Deutsche Texaco Aktiengesellschaft. Process for the separation of unsaturated compounds from liquid hydrocarbon mixtures. 4,290,881, Cl. 208-310.00R.
Diemi, Werner, to Styner & Bienz AG. Method for producing aerosol can tops. 4,290,294, Cl. 72-348.000.
Dieterle, Gerhard, to Erwin Sick GmbH Optik-Elektronik. Safety circuit for a potentially dangerous machine monitored by light. 4,291,359, Cl. 361-173.000.
Dietz, Charles F.: *See*—
Schmidt, Lewis W.; Bettencourt, Darryl G.; Dietz, Charles F.; and Marshall, George E., Jr., 4,290,352, Cl. 100-100.000.
Dingeldein, Elvira: *See*—
Wahlig, Helmut; Dingeldein, Elvira; and Braun, Dietrich, 4,291,013, Cl. 424-16.000.
Dinger, Edward H., to General Electric Company. Programmable overload circuit. 4,291,355, Cl. 361-31.000.
Discenza, Frank J., to Carlingswitch, Inc. Illuminated toggle switch. 4,291,211, Cl. 200-311.000.
Disco, Paulus J.; Quargentan, Ernesto; and Santalucia, Pietro, to U.S. Philips Corporation. Heat pump water heater. 4,290,275, Cl. 62-238.600.
Dissmore, James R. Fuel system for IC engine. 4,290,392, Cl. 123-1.00A.
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Pardue, James I., Jr.; Hornsby, William M.; and Noble, Henry J., III, 4,290,245, Cl. 52-157.000.
Dlugos, Daniel F., to Pitney Bowes Inc. Mailing system. 4,291,374, Cl. 364-466.000.
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Dompas, John, to Metallurgie Hoboken-Overpelt. Manufacture of copper wire rod. 4,290,823, Cl. 148-2.000.
Donahue, John W., to Mead Corporation, The. Jet drop copier with multiplex ability. 4,291,340, Cl. 358-296.000.
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Dorman, Richard A.: *See*—
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Dotson, Harold C., Sr. Minnow dippers. 4,290,221, Cl. 43-4.000.
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Free, Dustin L.; and Phillips, Howard M., 4,290,485, Cl. 166-281.000.
Montgomery, Carl T., 4,290,810, Cl. 106-13.000.
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Repsher, Wendy J.; and Rapstein, Kirby T., 4,291,001, Cl. 423-179.500.
Saunders, Frank L., 4,291,130, Cl. 521-136.000.
Stevens, Timothy S.; and Miller, Theodore E., Jr., 4,290,775, Cl. 23-230.00R.
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Meyer, Willy; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; and Karrer, Friedrich, 4,291,056, Cl. 424-304.000.
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Files, Thomas I.; and Beutner, Donald H., 4,290,651, Cl. 299-7.000.
Pavlica, Stanley R.; and McCreight, Donald O., 4,290,814, Cl. 501-107.000.
Dreyer, Andre T. Shotshells. 4,290,365, Cl. 102-449.000.
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DuBois, Grant E. N-Sulfonyl amine-mediated sulfamation of amines. 4,290,975, Cl. 260-513.600.

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Duckworth, Roger G., to Ultra Electronic Controls Limited. Sputtering apparatus. 4,290,875, Cl. 204-298.000.

Dudeck, Christian: *See—*
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Dudt, Philip J., to Conoco Inc. Method for gasifying finely-divided coal in a fixed bed gasifier. 4,290,780, Cl. 48-210.000.

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Dunlop Limited: *See—*
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Stall, Alan D., 4,291,082, Cl. 428-138.000.

Durand, Alain J. M.; and Farcot, Jean C. Catheter with bulb. 4,290,428, Cl. 128-349.00B.

Dyett, Derek H.; Hirsh, Ivan Y.; Preston, Edward G.; and Williams, Robert E., to Molins Limited. Filter attachment machines. 4,290,518, Cl. 198-450.000.

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E. R. Squibb & Sons, Inc.: *See—*
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Baumeister, Hans-Peter, 4,290,677, Cl. 354-127.000.
Hines, Stephen P., 4,290,684, Cl. 354-286.000.
Hozman, Nelson D.; Reynolds, Robert L.; and Kirn, Thomas G., 4,290,676, Cl. 354-121.000.
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Reinke, William L.; and Stearley, John W., 4,291,207, Cl. 200-42.00R.
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Weinberg, Aaron; Ebert, Paul M.; Fee, Joseph J.; Kaminsky, Yaroslav; Keblawi, Feisal S.; and Scales, Walter C., 4,291,409, Cl. 375-1.000.

Eccleston, Thomas F.; and Wilson, Walter M., to Consolidated Edison Company of New York, Inc. Venting apparatus for an electric cable pothead. 4,291,192, Cl. 174-11.0BH.

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Vlahov, Radoslav Y.; Krikoryan, Dikran A.; Zagorova, Maria S.; Ninova, Maya H.; and Parushev, Stoyan P., 4,290,862, Cl. 204-59.00R.

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Crum, Glen F.; and Paton, Samuel J., 4,291,184, Cl. 585-443.000.

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Ellis, Roger H.; and Clarke, Raymond, to Raychem Corporation. Fiber optic waveguide termination and method of forming same. 4,290,668, Cl. 350-96.200.

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Elm Window Co.: *See—*
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Elmore, Charles E.; and Harmon, David H., to Ciba-Geigy Corporation. Process for making urea-formaldehyde insulation. 4,291,128, Cl. 521-54.000.

Elsner, Emil; Kasper, Rudolf; and Schwabe, William E., to Korf & Fuchs Systemtechnik GmbH. Fluid-cooled holder for an electrode tip. 4,291,190, Cl. 13-18.00R.

Ely, Richard A.; and McClaren, Sherwood W., III, to Vought Corporation. Sound attenuating structural panel. 4,291,080, Cl. 428-116.000.

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Engelhaupt, Darell E., to United States of America, Energy. Process for forming a nickel foil with controlled and predetermined permeability to hydrogen. 4,290,858, Cl. 204-12.000.

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Essex, Donald D. Liquid spray device with adaptive duty cycle. 4,290,274, Cl. 62-157.000.
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Fairchild Incorporated: *See*—
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Fairchild, James L.: *See*—
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Farcilli, Andre; Medici, Italo; Fournex, Robert; and Barzaghi, Fernando, to Roussel Uclaf. Cerebral vasodilating 20,21-dinoreburnamenine derivatives. 4,291,038, Cl. 424-256.000.
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Field, Marshall L., Jr.: *See*—
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Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft Offenbach. Selective ink and wetting liquid, or wetting liquid only, application system for offset printing presses. 4,290,360, Cl. 101-148.000.
Fischer, Klaus H.; Kroschel, Heinz; and Kolf, Heinrich, to Dynamit Nobel Aktiengesellschaft. Separation mechanism for releasing an aerodynamic braking device from a load. 4,290,637, Cl. 294-83.00A.
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Cincotta, Louis; and Foley, James W., 4,290,955, Cl. 260-336.000.
Cournoyer, Richard L.; and Foley, James W., 4,290,950, Cl. 260-326.12R.
Forbes, Brian K.; and Catiller, Robert D., to Burroughs Corporation. Microprocessor system with specialized instruction format. 4,291,372, Cl. 364-200.000.
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Gerber, Wesley D., 4,290,670, Cl. 350-274.000.
Wagner, Gary L., 4,291,286, Cl. 333-166.000.
Ford Motor Company: *See*—
Elkins, Perry E., 4,290,192, Cl. 29-623.500.

Gaerttner, Martin R.; and Jaklevic, Robert C., 4,290,861, Cl. 204-56.00R.
Foret, Michel: *See—*
Schoeps, Bernard; and Foret, Michel, 4,291,074, Cl. 427-367.000.
Fossati, Piero: *See—*
Acquati, Giancarlo; Berti, Giovanni; and Fossati, Piero, 4,291,121, Cl. 435-10.000.
Fosseux, Pierre-Yves: *See—*
Buhler, Marcel; Olofsson, Mats; and Fosseux, Pierre-Yves, 4,291,067, Cl. 426-582.000.
Foster-Miller Associates, Inc.: *See—*
West, Jeffery L.; and Berry, Randy, 4,290,516, Cl. 192-56.00L.
Foster, Sue T., executrix: *See—*
Malone, Thomas R.; Foster, Talmage D., Jr., deceased; and Foster, Sue T., executrix, 4,290,899, Cl. 252-8.50A.
Foster, Talmage D., Jr., deceased: *See—*
Malone, Thomas R.; Foster, Talmage D., Jr., deceased; and Foster, Sue T., executrix, 4,290,899, Cl. 252-8.50A.
Foster Wheeler Limited: *See—*
Ruhe, Anthony; and Adams, Peter J., 4,290,388, Cl. 122-235.00A.
Fournex, Robert: *See—*
Farcilli, Andre; Medici, Italo; Fournex, Robert; and Barzaghi, Fernando, 4,291,038, Cl. 424-256.000.
Fowler, Eliot P.; and Taylor, John R., to United Kingdom Atomic Energy Authority. In high frequency screening of electrical systems. 4,290,663, Cl. 339-143.00R.
Fowler, William H.; and Warner, Frederick L., to American Newspaper Publishers Association. On the fly adjusting mechanism for rotary printing presses. 4,290,361, Cl. 101-182.000.
Framatome: *See—*
Gigou, Roger, 4,290,853, Cl. 176-87.000.
Frame, Robert R., to UOP Inc. Catalytic composite useful for the treatment of mercaptan-containing sour petroleum distillate. 4,290,913, Cl. 252-428.000.
France, Stephen W.: *See—*
Caldwell, John T.; Fehlau, Paul E.; and France, Stephen W., 4,291,227, Cl. 250-328.000.
Franck, Jean-Pierre: *See—*
Aude, Robert; Baumgartner, Pierre; Desmarquest, Jean-Pierre; and Franck, Jean-Pierre, 4,290,973, Cl. 260-505.00R.
Frank, Roy W.; and Staerzl, Richard E., to Brunswick Corporation. Two-cycle engine with fuel injection. 4,290,394, Cl. 123-73.00A.
Franks, John A., Jr., to Vulcan Materials Company. Catalytic process for the production of alkali metal stannates. 4,291,009, Cl. 423-593.000.
Frantello, Alfred A. Rotary assembly for cutting grass and other vegetation. 4,290,257, Cl. 56-12.700.
Frazier, Henry F.: *See—*
Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., 4,290,816, Cl. 106-287.320.
Frederick Electronics Corp.: *See—*
Spaniol, John W.; Bowerman, John J.; and Perlman, Marvin, 4,291,196, Cl. 178-3.000.
Free, Dustin L.; and Phillips, Howard M., to Dow Chemical Company, The. Reduction of water production from hydrocarbon containing subsurface formations. 4,290,485, Cl. 166-281.000.
Freed, Meier E.; and Diebold, James L., to American Home Products Corporation. Aryl-1-mercaptoalkanoylproline and homoproline derivatives. 4,290,952, Cl. 260-326.470.
Freeman, Richard B.: *See—*
Jahnle, Herbert A.; and Freeman, Richard B., 4,290,235, Cl. 49-502.000.
Freund, Edouard: *See—*
Sugier, Andre; and Freund, Edouard, 4,291,126, Cl. 518-713.000.
Frey, Raymond, to Contraves AG. Reducing light scatter in photometric measurements involving suspended particles. 4,290,772, Cl. 23-230.00B.
Fricke, Richard J.: *See—*
Kennedy, Richard B., 4,291,129, Cl. 521-103.000.
Friedrich, Hans-Helmut: *See—*
Wirth, Hermann O.; Bussing, Jurgen; and Friedrich, Hans-Helmut, 4,290,940, Cl. 260-45.80N.
Friese, Egon F., to International Telephone and Telegraph Corporation. Assembly apparatus for electrical connectors. 4,290,178, Cl. 29-33.00M.
Frito-Lay, Inc.: *See—*
Topor, Michael G.; Wicklund, Peter A.; and Ivers, John T., 4,290,989, Cl. 264-142.000.
Fritz, Rolf; Kalden, Bernhard; and Kissel, Karl-Friedrich, to Hochtemperatur-Reaktorbau GmbH. Roof reflector for a gas-cooled pebble-bed reactor and process for the disassembly of the roof reflector. 4,290,852, Cl. 176-58.0PB.
Frohberger, Paul-Ernst: *See—*
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,291,044, Cl. 424-269.000.
Kranz, Eckart; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,291,047, Cl. 424-273.00R.
Fromm, Dietrich: *See—*
Arlt, Joachim; and Fromm, Dietrich, 4,291,254, Cl. 315-240.000.
Frosch, Robert A.; and Qader, Shaik A., to United States of America, National Aeronautics and Space Administration. Solar heated fluidized bed gasification system. 4,290,779, Cl. 48-89.000.
Fuchigami, Mitsuru: *See—*
Tsukahara, Hirokazu; Fuchigami, Mitsuru; and Kagota, Nobuhiro, 4,291,102, Cl. 428-537.000.
Fuji Photo Film Co., Ltd.: *See—*
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,291,119, Cl. 430-348.000.
Kimura, Tsutomu; Miyoshi, Hitoshi; and Mori, Sumio, 4,291,305, Cl. 340-734.000.
Kobayashi, Tomoyuki; Usami, Toshimasa; Misu, Hiroshi; and Sera, Hidefumi, 4,291,120, Cl. 430-531.000.
Kondoh, Syunichi; Matsufuji, Akihiro; and Umehara, Akira, 4,290,870, Cl. 204-159.150.
Minamizono, Junji; Yoneyama, Masakazu; and Sasaki, Jun, 4,291,113, Cl. 430-202.000.
Muramatsu, Katsuji; and Fujita, Yoshihiro, 4,290,680, Cl. 354-203.000.
Ohishi, Chikashi; and Hasegawa, Akira, 4,291,117, Cl. 430-309.000.
Fuji Seal Industry Co., Ltd.: *See—*
Fujio, Masaaki, 4,290,992, Cl. 264-163.000.
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Hattori, Satoru, to Mitsubishi Petrochemical Co., Ltd. Novel propylene copolymers. 4,291,140, Cl. 525-321.000.
Fujii, Tadashiro: *See—*
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.
Fujimori, Naoji: *See—*
Asai, Tsuyoshi; Fujimori, Naoji; and Yamamoto, Takaharu, 4,290,807, Cl. 75-233.000.
Fujimoto, Einosuke: *See—*
Takahashi, Yasunobu; Fujimoto, Einosuke; Shimizu, Toshio; and Kato, Takeo, 4,290,946, Cl. 260-239.00B.
Fujimura, Toshio: *See—*
Tonomura, Yoshinobu; Fujimura, Toshio; Hara, Masanori; and Takenoya, Hideaki, 4,290,375, Cl. 112-121.120.
Fujio, Masaaki, to Fuji Seal Industry Co., Ltd. Heat-shrinkable film tube with an internally ribbed closed end, and a method of making it. 4,290,992, Cl. 264-163.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takaya, Takao; and Chiba, Toshiyuki, 4,291,031, Cl. 424-246.000.
Fujita, Yoshihiro: *See—*
Muramatsu, Katsuji; and Fujita, Yoshihiro, 4,290,680, Cl. 354-203.000.
Fujitsu Fanuc Limited: *See—*
Kawada, Shigeki; Ishida, Hiroshi; and Sakamoto, Keiji, 4,291,265, Cl. 318-782.000.
Fujitsu Limited: *See—*
Higuchi, Mitsuo; and Miyasaka, Kiyoshi, 4,291,326, Cl. 357-51.000.
Ichinose, Yoshito; Fukuda, Takeshi; and Kobayashi, Naoaki, 4,290,188, Cl. 29-591.000.
Kawashima, Kenichi; Yasuda, Hiroshi; and Uema, Kenyu, 4,291,231, Cl. 250-492.00A.
Nakano, Masao; Nakano, Tomio; Takemae, Yoshihiro; and Kabashima, Katsuhiko, 4,291,394, Cl. 365-206.000.
Ogawa, Kazuo; and Suzuki, Eiji, 4,291,408, Cl. 371-49.000.
Fukatsu, Shunzo: *See—*
Yoneta, Toshio; Shibahara, Seiji; Seki, Shigeo; and Fukatsu, Shunzo, 4,290,972, Cl. 260-465.00B.
Fukuda, Hiroaki: *See—*
Imai, Shigeki; and Fukuda, Hiroaki, 4,291,399, Cl. 368-82.000.
Fukuda, Takeshi: *See—*
Ichinose, Yoshito; Fukuda, Takeshi; and Kobayashi, Naoaki, 4,290,188, Cl. 29-591.000.
Fukuhara, Tetsukazu, to Neturen Company Ltd. Apparatus for continuously forming a coating layer on unbonded PC steel bars. 4,290,841, Cl. 156-464.000.
Fukushima, Hiroshi: *See—*
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.
Full, Gary G.; and Tedeschi, Rinaldo R., to United Technologies Corporation. Relative manifold vacuum of an internal combustion engine. 4,291,382, Cl. 364-551.000.
Full, Gary G.: *See—*
Tedeschi, Rinaldo R.; and Full, Gary G., 4,291,383, Cl. 364-551.000.
Fuller, Alfred B.: *See—*
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., 4,290,316, Cl. 74-5.460.
Fulop, Ferenc: *See—*
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.
Funabiki, Kyohei; Matsushima, Noriaki; and Inouye, Naomitsu, to Sumitomo Durez Company, Ltd. Binder for dry hot coat foundry process. 4,290,928, Cl. 260-28.00P.
Furudate, Mituaki: *See—*
Uesugi, Nobuo; Miyazawa, Tatsuo; Furudate, Mituaki; Sasaki, Keiichi; and Mizuguchi, Hiroji, 4,290,849, Cl. 176-19.00R.
Furukawa Metals Company, Ltd.: *See—*
Inoue, Sadao; Umemura, Tetsuya; Suzuki, Hiroshi; and Tago, Makoto, 4,290,806, Cl. 75-153.000.
G P A International: *See—*
Guerre-Berthelot, Pierre, 4,290,150, Cl. 2-421.000.
Gable, Wilburn K. Felt paper roller assembly. 4,290,842, Cl. 156-577.000.

Gabriel, Ronald M.: *See—*
Coburn, Robert E.; Gabriel, Ronald M.; and Tuthill, Richard S., 4,290,558, Cl. 239-400.000.

Gaerttner, Martin R.; and Jaklevic, Robert C., to Ford Motor Company. Growth of oxide films by vapor solid state anodization. 4,290,861, Cl. 204-56.00R.

Gaffney, LeRoy J., to Inland Steel Company. Method for treating refractory block. 4,290,984, Cl. 264-30.000.

Gale, Jean L. Combination horizontally and vertically mounted display. 4,290,216, Cl. 40-152.100.

Gall, Chester E.: *See—*
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., 4,290,316, Cl. 74-5.460.

Gallagher, Ronald M.; Nadler, Michael E.; Highsmith, Charles E.; and Minchey, Richard L., to Unarco Industries, Inc. Stackable pallet assembly. 4,290,370, Cl. 108-53.500.

GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Grottrup, Helmut, 4,291,222, Cl. 235-380.000.

Garavaglia, Carlo: *See—*
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.

Gardner, George A., to Sybron Corporation. AC Generator system having stabilized sensitivity for sensing the presence or absence of a conductive object. 4,291,280, Cl. 331-65.000.

Garlaschelli, Luigi: *See—*
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.

Gartmann, Achim K.: *See—*
Gartmann, Hans H.; and Gartmann, Achim K., 4,290,888, Cl. 210-356.000.

Gartmann, Hans H.; and Gartmann, Achim K. Strainer. 4,290,888, Cl. 210-356.000.

Garwin, Richard L., to International Business Machines Corporation. Alignment or correction of energy beam type displays. 4,291,256, Cl. 315-368.000.

Garzulano, Gianfranco: *See—*
Brusasca, Gianfranco; and Garzulano, Gianfranco, 4,290,376, Cl. 112-121.260.

Gavris, Genrikh B.: *See—*
Lukhvich, Alexandr A.; Rudnitsky, Valery A.; Linnik, Ivan I.; and Gavris, Genrikh B., 4,291,270, Cl. 324-230.000.

GD-Anker Gebirgs-Dubel-Anker GmbH & Co. KG: *See—*
Gruber, Rudolf, 4,290,338, Cl. 411-21.000.

Gebhardt Satzinger Metallwarenfabrik: *See—*
Satzinger, Roland, 4,290,561, Cl. 242-55.000.

Gebruder Junghans GmbH: *See—*
Wolber, Robert; and Obergfell, Walter, 4,291,210, Cl. 200-252.000.

Geike, Bernd: *See—*
Bruckner, Georg F.; Geike, Bernd; Berger, Fritz; and Schoen, Bernd-Jurgen, 4,290,147, Cl. 2-18.000.

Geisler, Gottfried: *See—*
Appel, Eggert; Nissen, Peter; Geisler, Gottfried; and Kiene, Wilfried, 4,290,313, Cl. 73-861.170.

Gelhard, Egon, to Fichtel & Sachs AG. Electrically and manually operable locking mechanism and drive arrangement for the same. 4,290,634, Cl. 292-201.000.

General Battery Corporation: *See—*
Bevan, William G., 4,290,444, Cl. 137-255.000.

General Dynamics, Pomona Division: *See—*
Reavill, Joseph A.; and Arachi, John M., 4,290,838, Cl. 156-286.000.

General Electric Company: *See—*
Bennett, Moreland P.; and Vrabel, Edward A., 4,291,215, Cl. 219-118.000.
Brezosky, Bernard J., 4,290,660, Cl. 312-253.000.
Burns, Richard D., 4,290,291, Cl. 72-316.000.
Charlebois, Thomas F.; and Roswog, Edward J., 4,290,309, Cl. 73-621.000.
Cohen, Stuart C., 4,290,937, Cl. 260-40.00R.
Collins, Edward J., 4,290,747, Cl. 431-359.000.
Collins, Edward J.; and Lenkner, William A., 4,290,748, Cl. 431-359.000.
Coppa, Anthony P., 4,290,189, Cl. 29-596.000.
Cutler, Scott E.; and Eichelberger, Charles W., 4,291,303, Cl. 340-711.000.
DeCarlo, Vincent J.; Powers, Robert W.; and Mitoff, Stephan P., 4,291,108, Cl. 429-193.000.
Dinger, Edward H., 4,291,355, Cl. 361-31.000.
Hooke, John W., 4,291,106, Cl. 429-1.000.
Mark, Victor; and Wilson, Phillip S., 4,290,934, Cl. 260-30.80R.
Mark, Victor, 4,291,150, Cl. 528-199.000.
Mark, Victor, 4,291,151, Cl. 528-199.000.
Mark, Victor; and Wilson, Charles A., II, 4,291,177, Cl. 568-726.000.
Nathan, Bernard D.; and Witter, Donald R., 4,291,314, Cl. 346-74.500.
Pohl, Walter J., 4,290,481, Cl. 165-26.000.
Quine, John P., 4,291,278, Cl. 330-286.000.
Shaw, David G., 4,290,926, Cl. 252-579.000.
Vakil, Himanshu B., 4,290,272, Cl. 62-114.000.

General Foods Corporation: *See—*
Weaver, James A., 4,290,730, Cl. 414-607.000.

General Motors Corporation: *See—*
Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., 4,290,627, Cl. 280-729.000.
Mann, Gamdur S.; Tendulkar, Dilip V.; and Parker, William J., 4,290,263, Cl. 60-311.000.
Pomerantz, Allen J., 4,290,400, Cl. 123-440.000.
Sullivan, Leo S., Jr.; and Muzechuk, Richard A., 4,290,626, Cl. 280-692.000.

General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi, 4,291,412, Cl. 455-154.000.

Gentex Corporation: *See—*
Aileo, Jackson A., 4,290,149, Cl. 2-414.000.

Georgiev, Atanas G.; Andreev, Kino D.; and Konstantinova, Kina V., to DSO "Pharmachim". Method of preparing 2-(phenylamino)-imidazolines-(2). 4,290.971, Cl. 260-453.500.

Gerber, Wesley D., to Ford Aerospace & Communications Corp. Optical receiver/transmitter system employing a common optical aperture. 4,290,670, Cl. 350-274.000.

Gerety, Robert J.: *See—*
Tabor, Edward; and Gerety, Robert J., 4,291,020, Cl. 424-89.000.

Gerhard, Thomas: *See—*
Brause, Joachim; Gerhard, Thomas; Keller, Manfred; and Olszok, Henry, 4,290,367, Cl. 104-105.000.

Geronime, Robert L., to Rosemount Inc. Target flowmeter. 4,290,314, Cl. 73-861.520.

Getz, Edward H.: *See—*
Braga, Albert T.; Cartier, Roger J.; Getz, Edward H.; and Hafstrom, Warren R., 4,291,238, Cl. 307-141.400.

Getz, John, Jr. Self-dropping flag for mail boxes. 4,290,549, Cl. 232-35.000.

Gibson, Joseph T.; and Duhon, Gerald L., to A. C. Company. Drilling fluid circulating and monitoring system and method. 4,290,305, Cl. 73-155.000.

Gigou, Roger, to Framatome. Protection of steam piping in a nuclear reactor. 4,290,853, Cl. 176-87.000.

Gil-Av, E.: *See—*
Hare, P. Edgar; and Gil-Av, E., 4,290,893, Cl. 210-656.000.

Gilbert, Woodrow P.: *See—*
Burns, Alonzo M., Jr.; Silliman, Jeffrey E.; Gilbert, Woodrow P.; and Pascoe, William M., Sr., 4,290,766, Cl. 8-491.000.

Gillings, Christopher; and Palmer, John H., to Fisons Limited. Arthropodicidal granular formulation. 4,291,052, Cl. 424-282.000.

Giorgini, Norman L., to Minnesota Mining and Manufacturing Company. Method and apparatus using low gloss pressure fusing roll. 4,290,691, Cl. 355-3.0FU.

Girgis, Makram M.; Jackson, David E.; and Mannuzza, Frank J., to Miles Laboratories, Inc. Purification of lipoprotein cholesterol for use as a cholesterol reference material. 4,290,774, Cl. 23-230.00B.

Glaesener, Ernest, to Arbed S.A. Vehicle-stopping device for safety barriers. 4,290,585, Cl. 256-13.100.

Glaxo Group Limited: *See—*
Reynolds, Derek P., 4,291,059, Cl. 424-311.000.

Glaxo Operations UK Limited: *See—*
Cherry, Peter C.; Newall, Christopher E.; Watson, Nigel S.; Gregory, Gordon I.; and Ward, Peter, 4,290,949, Cl. 260-245.300.

Glickman, Michael; and Hollington, Geoffrey A., to Pel Limited. Stacking chair. 4,290,645, Cl. 297-239.000.

Gobien, Ernst: *See—*
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,290,397, Cl. 123-195.00A.

Gobler, Hans. Lawnmower blades. 4,290,258, Cl. 56-295.000.

Goethert, Bernhard H.: *See—*
Hopkins, Harry C.; Goethert, Bernhard H.; and Power, Joseph K., 4,290,500, Cl. 180-117.000.

Goetz, Richard W.; Meixsel, Lawrence D.; and Smith, David W., to National Distillers and Chemical Corp. Rhodium catalyzed process for acetaldehyde and ethanol. 4,291,179, Cl. 568-882.000.

Gohrbandt, Wilhelm: *See—*
Neeff, Rutger; Kuth, Robert; Kuhnel, Werner; and Gohrbandt, Wilhelm, 4,290,768, Cl. 8-532.000.

Gold, Joseph. Method of treating tumors and cancerous cachexia with L-tryptophan. 4,291,048, Cl. 424-274.000.

Goldberg, Erwin, to Northwestern University. Antigenic peptide compound. 4,290,944, Cl. 260-112.50R.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Toy vehicles with automatic banking. 4,290,228, Cl. 46-262.000.

Goldfarb, Samuel; and Reilly, Thomas, to Litton Systems, Inc. Electromagnetic interference reduction for electronic line printers. 4,290,705, Cl. 400-618.000.

Goldsmith, Jeff M.: *See—*
Yates, Douglas A.; Hatch, Arthur E.; and Goldsmith, Jeff M., 4,290,835, Cl. 156-601.000.

Gooch, Beverley R., to Ampex Corporation. Multichannel transducer structure with improved interchannel cross talk rejection. 4,291,352, Cl. 360-121.000.

Goodall, Maurice. Spray inhibiting means for use on a road vehicle. 4,290,619, Cl. 280-154.50R.

Goodman, Ronald D.; Krueger, Wallace F.; and Shaw, Anthony R., to Libbey-Owens-Ford Company. Solar energy collector. 4,290,413, Cl. 126-426.000.

Goodwin, Joseph. Field dressing device. 4,290,201, Cl. 30-294.000.

Gordon, David J.; and Wessel, James K., to Dow Corning Corporation. Dewatering fine coal slurries using organopolysiloxanes. 4,290,896, Cl. 210-710.000.

Gordon, Pat L.: *See—*
Bihn, Daniel; and Gordon, Pat L., 4,290,430, Cl. 128-419.0PT.

Gorgerino, Mario; and Videau, Daniel, to Compagnie Universelle D'Acetylene et D'Electro-Metallurgie. Method for obtaining iron-based alloys allowing in particular their mechanical properties to be improved by the use of lanthanum, and iron-based alloys obtained by the said method. 4,290,805, Cl. 75-130.00R.

Goring, Joachim: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,291,037, Cl. 424-253.000.

Gospodar, Reinhard. Apparatus for controlling the closing limit of a carburetor throttle valve. 4,290,323, Cl. 74-860.000.

Goto, Kenji: *See—*
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.

Governor & Company of the Bank of England: *See—*
Lee, Peter D., 4,290,630, Cl. 283-8.00R.

Gozzo, Franco: *See—*
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.

Graham, Donald W.: *See—*
Brown, Jeannette E.; Rogers, Edward F.; and Graham, Donald W., 4,290,966, Cl. 260-413.000.

Graham, Lawrence L. Storm sashes and method and apparatus for manufacturing. 4,290,251, Cl. 52-656.000.

Graham, Lynette E.: *See—*
Anderton, John J.; and Graham, Lynette E., 4,290,193, Cl. 29-764.000.

Graham Magnetics, Inc.: *See—*
Cosby, Phillip A., 4,290,821, Cl. 134-8.000.

Gram, Martin M., to MTS Systems Corporation. High volume poppet valve with orifice opening speed control. 4,290,343, Cl. 91-461.000.

Grancher, Pierre: *See—*
Batteux, Jacques; Blanc, Claude; and Grancher, Pierre, 4,291,003, Cl. 423-228.000.

Granger, Donald W., to Waukesha-Pearce Industries, Inc. Nitrogen liquid to gas converter. 4,290,271, Cl. 62-53.000.

Grasselli, Robert K.: *See—*
Suresh, Dev D.; Brazdil, James F.; and Grasselli, Robert K., 4,290,920, Cl. 252-439.000.

Grassin, Jerome; Thouvenin, Maurice; and Epie, Jean-Claude, to Saint Gobain Industries. Apparatus for deforming an object and securing it to a support member. 4,290,544, Cl. 228-7.000.

Graversen, Niels P. G.: *See—*
Molgaard, Aage; and Graversen, Niels P. G., 4,290,553, Cl. 236-42.000.

Great Lakes Carbon Corporation: *See—*
Hsu, Harry L.; Hardin, Edward E.; and Grindstaff, Lloyd I., 4,291,008, Cl. 423-461.000.

Greatbatch, Wilson. Method for electronic control of infections using silver ions. 4,291,125, Cl. 435-240.000.

Green, Bruce H.: *See—*
Alfano, Robert R.; and Green, Bruce H., 4,291,282, Cl. 331-94.50S.

Green, Talmage O., to Snap-on Tools Corporation. Torque release wrench of the preset type. 4,290,329, Cl. 81-477.000.

Gregory, Gordon I.: *See—*
Cherry, Peter C.; Newall, Christopher E.; Watson, Nigel S.; Gregory, Gordon I.; and Ward, Peter, 4,290,949, Cl. 260-245.300.

Gregory, William T., Jr. Greenhouse tubular insulation barrier. 4,290,242, Cl. 52-2.000.

Grenoble, Dale E.: *See—*
Beierle, John W.; and Grenoble, Dale E., 4,291,017, Cl. 424-52.000.

Gretzinger, Adolf: *See—*
Nigol, Olaf; Houston, Herbert J.; and Gretzinger, Adolf, 4,291,194, Cl. 174-40.00R.

Griffin, Edward L.: *See—*
Young, Frederick A.; and Griffin, Edward L., 4,291,287, Cl. 333-210.000.
Young, Frederick A.; Griffin, Edward L.; and Hendrick, Louis W., 4,291,288, Cl. 333-212.000.

Griffith, John A. Apparatus for picking up overturned vehicles. 4,290,731, Cl. 414-678.000.

Griffith, John D., to Bonas Machine Company Limited. Yarn feed controlling device. 4,290,461, Cl. 139-450.000.

Griffiths, Kenneth F. Method for production of aluminum oxide. 4,291,011, Cl. 423-625.000.

Grimaldi, Frank G.: *See—*
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,291,273, Cl. 324-343.000.

Grindstaff, Lloyd I.: *See—*
Hsu, Harry L.; Hardin, Edward E.; and Grindstaff, Lloyd I., 4,291,008, Cl. 423-461.000.

Grof, Ferenc: *See—*
Torok, Gabor; Sarosi, Lajos; Grof, Ferenc; Becsei, Tamas; and Barta, Peter, 4,290,894, Cl. 210-661.000.

Groft, Donald H.: *See—*
Eckels, George H.; Groft, Donald H.; and Stallard, Wayne R., 4,290,584, Cl. 254-380.000.

Gronberg, Pauli, to Fincoil-teollisuus Oy. Apparatus for determining the differential pressure and the volumetric fluid flow in a conduit. 4,290,315, Cl. 73-861.610.

Gross, Henry; and Gross, Samuel. Ticket printing and advancing device. 4,290,355, Cl. 101-69.000.

Gross, Samuel: *See—*
Gross, Henry; and Gross, Samuel, 4,290,355, Cl. 101-69.000.

Grottrup, Helmut, to GAO Gesellschaft fur Automation und Organisation mbH. Method and apparatus for card authentication using display of symbols for identification of a personal code word. 4,291,222, Cl. 235-380.000.

Gruber, George W.: *See—*
Harman, Douglas G.; Lambert, Ralph E.; and Gruber, George W., 4,290,303, Cl. 73-105.000.

Gruber, Rudolf, to GD-Anker Gebirgs-Dubel-Anker GmbH & Co. KG. Straddle cartridge for a straddle cartridge anchor. 4,290,338, Cl. 411-21.000.

Gsell, Laurenz: *See—*
Meyer, Willy; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; and Karrer, Friedrich, 4,291,056, Cl. 424-304.000.

GTE Products Corporation: *See—*
Anderton, John J.; and Graham, Lynette E., 4,290,193, Cl. 29-764.000.

Guerre-Berthelot, Pierre, to G P A International. Improved protective helmets and fastening devices therefor. 4,290,150, Cl. 2-421.000.

Guest, Allen M.: *See—*
Baum, Kurt; and Guest, Allen M., 4,291,171, Cl. 560-156.000.

Gulbins, Erich: *See—*
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,291,147, Cl. 528-119.000.

Gyula, Kakonyi: *See—*
Bela, Romvari; and Gyula, Kakonyi, 4,290,285, Cl. 70-276.000.

H. Berthold, AG.: *See—*
Siebeck, Helmut, 4,291,381, Cl. 365-523.000.

h.o.p. Consulab Inc.: *See—*
Mathieu, Serge, 4,291,356, Cl. 361-87.000.

Haas, Robert V., to Singer Company, The. Sewing cabinet with vertically movable table. 4,290,657, Cl. 312-21.000.

Haas, Roman, to Siemens Aktiengesellschaft. Power supply circuit with a self-oscillating blocking oscillator. 4,291,367, Cl. 363-21.000.

Hafferkamp, Harry C., to Owens-Illinois, Inc. Method and apparatus for reducing loader bar impact. 4,290,517, Cl. 198-427.000.

Hafstrom, Warren R.: *See—*
Braga, Albert T.; Cartier, Roger J.; Getz, Edward H.; and Hafstrom, Warren R., 4,291,238, Cl. 307-141.400.

Haga, Hirosi: *See—*
Ikeda, Kunio; and Haga, Hirosi, 4,290,857, Cl. 204-9.000.

Hagelbarger, David W.: *See—*
Anderson, Robert V.; Bayer, Douglas L.; Hagelbarger, David W.; and Kubik, Peter S., 4,291,198, Cl. 179-2.0DP.

Hagenauer, Joachim: *See—*
Bahl, Lalit R.; Cocke, John; Cullum, Clifton D., Jr.; and Hagenauer, Joachim, 4,291,406, Cl. 371-44.000.

Haines, Derrick J., to British Aerospace Public Limited Company. Stirling cycle apparatus. 4,290,264, Cl. 60-518.000.

Haisman, Derek R.: *See—*
Anema, Pieter J.; Haisman, Derek R.; and Adams, Rose M., 4,291,066, Cl. 426-578.000.

Haiss, Manfred. Package, especially tubular wrapper-type container with re-usable closure, especially for chocolates or candy. 4,290,526, Cl. 206-624.000.

Halasa, Adel F.; Hall, James E.; and Para, Adolph, to Firestone Tire & Rubber Company, The. Process for preparation of block copolymers. 4,291,139, Cl. 525-314.000.

Halcon Research and Development Corp.: *See—*
Barker, Robert S., 4,290,959, Cl. 260-348.240.

Hall, James E.: *See—*
Halasa, Adel F.; Hall, James E.; and Para, Adolph, 4,291,139, Cl. 525-314.000.

Halliburton Company: *See—*
Brisco, David P., 4,290,482, Cl. 166-70.000.

Hamada, Toshimitsu: *See—*
Mese, Michihiro; Kashioka, Seiji; Ejiri, Masakazu; Miyatake, Takafumi; Yamazaki, Isamu; and Hamada, Toshimitsu, 4,291,334, Cl. 358-101.000.

Hamamura, Kazuo: *See—*
Noda, Nobutaka; Hamamura, Kazuo; and Morita, Yoichi, 4,290,690, Cl. 355-3.00R.

Hambrecht, Jurgen; Lindenschmidt, Gerhard; and Regel, Walter, to BASF Aktiengesellschaft. Molding materials containing styrene/acrylonitrile copolymers and ethylene oxide/propylene oxide three-block copolymers. 4,291,134, Cl. 525-92.000.

Hamburger Stahlwerke GmbH: *See—*
Sensis, Siegfried; Schwerdtfeger, Joachim; Walden, Klaus; and Ameling, Dieter, 4,290,800, Cl. 75-12.000.

Hamilton, James M.; and Carrison, Craig L., to Hughes Aircraft Company. Charge coupled device charge comparator refresher. 4,291,243, Cl. 307-304.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Print head. 4,290,358, Cl. 101-111.000.

Hamisch, Paul H., Jr.: *See—*
Pabodie, Robert M.; and Hamisch, Paul H., Jr., 4,290,840, Cl. 156-384.000.

Handy, Richard L.: *See—*
Demirel, Turgut; and Handy, Richard L., 4,290,252, Cl. 52-742.000.

Hanes, Maurice H.; and Schlegel, Earl S., to Westinghouse Electric Corp. Thyristor with continuous recombination center shunt across planar emitter-base junction. 4,291,329, Cl. 357-64.000.

Hansen, Uwe: *See—*
Dielacher, Maximillian; and Hansen, Uwe, 4,290,881, Cl. 208-310.00R.

Hanson, Paul B. Articulated bed. 4,290,155, Cl. 5-465.000.
Hanyu, Susumu; and Kato, Kenji, to Janome Sewing Machine Co., Ltd. Sewing machine. 4,290,377, Cl. 112-158.00E.
Hara, Mamoru: *See*—
Miyake, Hideo; Sakamoto, Junichi; Sawaki, Masakazu; and Hara, Mamoru, 4,290,938, Cl. 260-40.00R.
Hara, Masanori: *See*—
Tonomura, Yoshinobu; Fujimura, Toshio; Hara, Masanori; and Takenoya, Hideaki, 4,290,375, Cl. 112-121.120.
Harada, Hidefumi: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, 4,291,010, Cl. 423-594.000.
Harada, Kiyoshi; Koida, Yoshiyuki; and Miura, Hiroshi, to Tanabe Seiyaku Co., Ltd. Fatty emulsion and process for the preparation thereof. 4,290,910, Cl. 252-312.000.
Hardin, Edward E.: *See*—
Hsu, Harry L.; Hardin, Edward E.; and Grindstaff, Lloyd I., 4,291,008, Cl. 423-461.000.
Hare, P. Edgar; and Gil-Av, E., to Yeda Research & Development Co. Ltd. Separation of amino acids by liquid chromatography using chiral eluants. 4,290,893, Cl. 210-656.000.
Harman, Douglas G.; Lambert, Ralph E.; and Gruber, George W., to Westinghouse Electric Corp. Apparatus for measuring surface scratches on a tube. 4,290,303, Cl. 73-105.000.
Harmon, David H.: *See*—
Elmore, Charles E.; and Harmon, David H., 4,291,128, Cl. 521-54.000.
Harris, Clarence J., to United States of America, Air Force. Biaxial shear force gauge. 4,290,302, Cl. 73-86.000.
Harris Corporation: *See*—
Davis, Robert C.; and Boyd, Robert W., 4,291,277, Cl. 330-149.000.
Ports, Kenneth A.; and Lucas, William G., 4,290,831, Cl. 148-187.000.
Harris, James: *See*—
Parvin, Charles V.; and Harris, James, 4,290,259, Cl. 56-364.000.
Harris, Jesse W.: *See*—
Earp, Sherald B.; Lutich, Louis L.; and Harris, Jesse W., 4,290,578, Cl. 251-63.000.
Harris, Richard G.; McRitchie, Allan C.; and Wilson, Alexander D., to Procter & Gamble Company, The. Washing and softening compositions. 4,291,071, Cl. 427-220.000.
Harrison, Boyd L.; and Dolfini, Joseph E., to Richardson-Merrell Inc. 7-(1,3-Dithiolan-2-imino)-Δ^2-cephalosporanic acid derivatives. 4,291,160, Cl. 544-17.000.
Hart, William B.; and Domloge, Rami. Fan unit. 4,290,393, Cl. 123-41.120.
Hartmann, Willy: *See*—
Heine, Hans-Georg; and Hartmann, Willy, 4,291,176, Cl. 568-381.000.
Harvey, Albert J., to Diamond International Corporation. Article support system. 4,290,519, Cl. 198-483.000.
Hasegawa, Akira: *See*—
Ohishi, Chikashi; and Hasegawa, Akira, 4,291,117, Cl. 430-309.000.
Hasegawa, Morihiro: *See*—
Maruhashi, Shigeaki; Hasegawa, Morihiro; and Yamauchi, Takashi, 4,290,803, Cl. 75-52.000.
Hashimoto, Shuji. Cutting apparatus for a rusty nut. 4,290,199, Cl. 30-180.000.
Hashimoto, Takao: *See*—
Morita, Minoru; Sato, Shimio; Hashimoto, Takao; and Kitaoka, Yoji, 4,290,999, Cl. 422-194.000.
Haskins, Steve W.: *See*—
Adams, William J.; Wernet, William F.; and Haskins, Steve W., 4,291,202, Cl. 179-103.000.
Hata, Shun-Ichi: *See*—
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.
Hata, Yoshitaka; and Okamura, Kenji, to Nissan Motor Company, Limited. Fuel supply control system. 4,290,404, Cl. 123-571.000.
Hatch, Arthur E.: *See*—
Yates, Douglas A.; Hatch, Arthur E.; and Goldsmith, Jeff M., 4,290,835, Cl. 156-601.000.
Hattori, Satoru: *See*—
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Hattori, Satoru, 4,291,140, Cl. 525-321.000.
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, to Nippondenso Co., Ltd.; Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control system for internal combustion engine. 4,290,398, Cl. 123-425.000.
Hattori, Tadashi: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,290,301, Cl. 73-35.000.
Haug, Theobald, to Ciba-Geigy Corporation. Heat-curable mixtures, which are stable on storage, of expoxide resins and β-aminocrotonic acid derivatives. 4,291,146, Cl. 528-119.000.
Hauni-Werke Korber & Co. KG: *See*—
Reuland, Joachim, 4,290,436, Cl. 131-108.000.
Hayashi, Kohtaro; Morihara, Ko; and Nakamura, Kohji, to Chisso Engineering Co.Ltd. Method for initiating biaxial stretching of plastic tubes and apparatus therefor. 4,290,996, Cl. 264-564.000.
Hayashi, Mitsuo: *See*—
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.
Hayashi, Taisen: *See*—
Kakeno, Sadao; Hayashi, Taisen; Komai, Hiromichi; and Yamazaki, Hiroshi, 4,291,316, Cl. 346-140.00R.
Hayashi, Tatsuo: *See*—
Horiuchi, Susumu; Hirano, Mikio; Yusa, Hideo; Chino, Koichi; and Hayashi, Tatsuo, 4,290,907, Cl. 252-301.10W.
Hayes, Norman J. Plastic post apparatus and methods. 4,290,712, Cl. 404-10.000.
Heberlein Hispano SA: *See*—
Vignon, Louis, 4,290,169, Cl. 19-159.00R.
Hechenbleikner, Ingenuin; Klicker, James D.; and Enlow, William P., to Borg-Warner Chemicals, Inc. Process for the preparation of phenol-free phosphites. 4,290,976, Cl. 260-973.000.
Hedstrom, Bengt O. A.; and Svensson, Claes G. S., to MoDo-Chemetics AB. Process for the efficient conversion of water-containing organic materials as fuels into energy. 4,290,269, Cl. 60-670.000.
Hehl, Karl. Precision drive for rotary switching controls of reciprocating unit. 4,290,317, Cl. 74-89.200.
Hehl, Walter H., to International Business Machines Corporation. Actuator mechanism for a print hammer or the like. 4,290,356, Cl. 101-93.340.
Hehlmann, Jan: *See*—
Pikon, Jerzy; and Hehlmann, Jan, 4,290,980, Cl. 261-94.000.
Heidelberger Druckmaschinen AG: *See*—
Thunker, Norbert, 4,290,595, Cl. 271-277.000.
Heine, Hans-Georg; and Hartmann, Willy, to Bayer Aktiengesellschaft. Production of insecticidally active vinyl-cyclopropane carboxylic acid esters. 4,291,176, Cl. 568-381.000.
Heine, Hans-Georg: *See*—
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,291,046, Cl. 424-272.000.
Heiss, Louis R., to Baxter Travenol Laboratories, Inc. Fluorometric analyzer including shutter means for simultaneously shielding sample and photodetector during sample change. 4,291,230, Cl. 250-458.000.
Held, Franklin R., to Ektelon. Racquetball racquet having a metal frame meshable with a throat piece. 4,290,604, Cl. 273-73.00G.
Helfer, Joel N.; and Ferrara, Elisa M., to American Home Products Corporation. Infant support board. 4,290,425, Cl. 128-133.000.
Hellman, Lars G. Process for the dehumidification of moist air or saturated water vapor. 4,290,208, Cl. 34-9.000.
Hemmat, Naim S.: *See*—
Smith, Robert W.; Hemmat, Naim S.; Bedell, John R.; Kavesh, Sheldon; and Draizen, Seymour, 4,290,476, Cl. 164-423.000.
Henderson, John G. N.; and Maturo, Robert J., to RCA Corporation. Search type tuning system with direct address channel selection apparatus. 4,291,413, Cl. 455-164.000.
Hendrick, Louis W.: *See*—
Young, Frederick A.; Griffin, Edward L.; and Hendrick, Louis W., 4,291,288, Cl. 333-212.000.
Henry, Charles L., to Akzona Incorporated. Use of co-solvents in amine N-oxide solutions. 4,290,815, Cl. 106-203.000.
Henry, David W.; and Tong, George L., to SRI International. Octanoylhydrazone derivatives of adriamycin. 4,291,157, Cl. 536-17.00A.
Hensel, Wolfgang; Berghof, Hans-Joachim; and Werner, Heinz, to Keiper Automobiltechnik GmbH & Co. K.G. Hinge mount assembly for reclinable seat. 4,290,647, Cl. 297-362.000.
Hensley, Robert C. Temperature actuated foundation ventilator. 4,290,554, Cl. 236-49.000.
Herbert, Normand C.; Burwen, Richard S.; and Mentelos, Richard A., to Novametrix Medical Systems, Inc. Transcutaneous oxygen and local perfusion measurement. 4,290,431, Cl. 128-635.000.
Herbstman, Sheldon; and Dorn, Peter, to Texaco Inc. Hydrocarbyl alkoxy amino alkylene-substituted asparagine and a motor fuel composition containing same. 4,290,778, Cl. 44-71.000.
Herlau, Henrik. Method and means for releasable securing of strings. 4,290,173, Cl. 24-118.000.
Herman Miller, Inc.: *See*—
Propst, Robert L.; and Raftery, William B., 4,290,369, Cl. 108-53.300.
Hermanson, Dean E.: *See*—
DeGeorge, Bernard J.; Hermanson, Dean E.; and Tomas, Carlos, 4,290,463, Cl. 141-387.000.
Hermecz, Istvan: *See*—
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.
Herpel, Donald R. Wind deflector. 4,290,639, Cl. 296-1.00S.
Herzog, Gordon W.: *See*—
Stevenson, Andrew C.; Herzog, Gordon W.; and Murdoch, James C., 4,291,263, Cl. 318-706.000.
Hess, Robert L.: *See*—
Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., 4,291,208, Cl. 200-148.00A.
Hewlett-Packard Company: *See*—
Osborne, Thomas E.; and Stockwell, Richard K., 4,291,385, Cl. 364-709.000.
Heyl & Co., Chemisch-Pharmazeutische Fabrik: *See*—
Bayer, Ernst; and Kutubuddin, Mohamed, 4,290,918, Cl. 252-431.00R.

Hidaka, Mikio: *See—*
Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; and Kurafuji, Toshio, 4,290,922, Cl. 252-456.000.

Highsmith, Charles E.: *See—*
Gallagher, Ronald M.; Nadler, Michael E.; Highsmith, Charles E.; and Minchey, Richard L., 4,290,370, Cl. 108-53.500.

Higuchi, Megumu: *See—*
Takahashi, Koichi; and Higuchi, Megumu, 4,290,452, Cl. 137-625.230.

Higuchi, Mitsuo; and Miyasaka, Kiyoshi, to Fujitsu Limited. Semiconductor device. 4,291,326, Cl. 357-51.000.

Hilsey, Arthur F. Multi-purpose precast concrete panels, and methods of constructing concrete structures employing the same. 4,290,246, Cl. 52-169.100.

Himmele, Walter: *See—*
Ross, Karl-Heinz; Dudeck, Christian; Himmele, Walter; Lebkuecher, Rolf; and Sauer, Wolfgang, 4,290,960, Cl. 260-348.570.

Hines, Stephen P., to Eastman Kodak Company. Image stabilizing apparatus. 4,290,684, Cl. 354-286.000.

Hinkel, Dwight B.: *See—*
Majkrzak, David S.; and Hinkel, Dwight B., 4,290,654, Cl. 301-9.0TV.

Hinz, Lorne C.; and Thomas, William P., to Northern Telecom Limited. Analog to digital converter using timed level changes. 4,291,299, Cl. 340-347.0AD.

Hiraga, Masaharu; and Kimura, Seishi, to Sankyo Electric Company Limited. Refrigerant compressors. 4,290,345, Cl. 92-79.000.

Hirai, Jun, to Sony Corporation. Video signal processing circuit for eliminating an interfering signal. 4,291,330, Cl. 358-8.000.

Hiramatsu, Kenzo; and Aiyama, Fumihiko, to Kioritz Corporation. Collecting apparatus. 4,290,165, Cl. 15-330.000.

Hirano, Mikio: *See—*
Horiuchi, Susumu; Hirano, Mikio; Yusa, Hideo; Chino, Koichi; and Hayashi, Tatsuo, 4,290,907, Cl. 252-301.10W.
Horiuchi, Susumu; Taniguchi, Takashi; Takeshima, Masaki; Hirano, Mikio; and Yusa, Hideo, 4,290,908, Cl. 252-301.10W.

Hirata, Tadashi; Ogasa, Takehiro; Saito, Hiromitsu; and Nakmizo, Nobuhiro, to Kyowa Hakko Kogyo Co., Ltd. Cephalosporin analogs and methods for production thereof. 4,291,164, Cl. 546-183.000.

Hirata, Takeyuki; Hiroki, Nobuyoshi; and Masuda, Seiichi, to Sumitomo Metal Industries, Ltd. Steel making process. 4,290,802, Cl. 75-52.000.

Hiroki, Nobuyoshi: *See—*
Hirata, Takeyuki; Hiroki, Nobuyoshi; and Masuda, Seiichi, 4,290,802, Cl. 75-52.000.

Hirsch, Wolfgang, to Behringwerke Aktiengesellschaft. Diagnostic agent for the detection of urobilinogen. 4,290,771, Cl. 23-230.00B.

Hirsh, Ivan Y.: *See—*
Dyett, Derek H.; Hirsh, Ivan Y.; Preston, Edward G.; and Williams, Robert E., 4,290,518, Cl. 198-450.000.

Hirst, George E.: *See—*
Mould, Henry M.; and Hirst, George E., 4,290,696, Cl. 356-300.000.

Hiruta, Toshio: *See—*
Komiyama, Katsuhiko; and Hiruta, Toshio, 4,291,400, Cl. 368-84.000.

Hitachi, Ltd.: *See—*
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.
Horiuchi, Susumu; Hirano, Mikio; Yusa, Hideo; Chino, Koichi; and Hayashi, Tatsuo, 4,290,907, Cl. 252-301.10W.
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Kanamaru, Hisanobu; Tatsumi, Hideo; Tohkairin, Akira; and Sayo, Kosaku, 4,290,295, Cl. 72-356.000.
Kanemaru, Kenji; and Iwasaki, Takashiro, 4,291,297, Cl. 340-347.0AD.
Kodama, Kazuyuki; Okada, Kunihiro; Huno, Takakazu; Endo, Takeyuki; and Shibuya, Yasutaka, 4,291,306, Cl. 340-744.000.
Marumoto, Katsuji; and Ohmae, Tsutcmu, 4,291,259, Cl. 318-139.000.
Mayama, Koichi; Yamaguchi, Noboru; Sugie, Mamoru; Kita, Yuzo; and Yoshizawa, Shigeru, 4,291,241, Cl. 307-269.000.
Mese, Michihiro; Kashioka, Seiji; Ejiri, Masakazu; Miyatake, Takafumi; Yamazaki, Isamu; and Hamada, Toshimitsu, 4,291,334, Cl. 358-101.000.
Mochizuki, Yasuhiro; Okano, Sadao; and Ogawa, Takuzo, 4,290,830, Cl. 148-187.000.
Nakagawa, Isao; and Minami, Norio, 4,291,335, Cl. 358-154.000.
Oishi, Kazuaki, 4,291,363, Cl. 361-333.000.
Omori, Takashi; and Sato, Takao, 4,290,850, Cl. 176-20.00R.
Saito, Takashi; Ohwada, Masataka; and Saito, Shozo, 4,290,906, Cl. 252-301.10W.
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.

Hitachi Maxell, Ltd.: *See—*
Sasaki, Shigeo; and Yamamoto, Osamu, 4,290,562, Cl. 242-74.000.

Hochstrate, Paul E., to Timex Corporation. Voltage multiplier and driver circuit. 4,291,369, Cl. 363-60.000.

Hochtemperatur-Reaktorbau GmbH: *See—*
Fritz, Rolf; Kalden, Bernhard; and Kissel, Karl-Friedrich, 4,290,852, Cl. 176-58.0PB.

Hock, Frederick D.: *See—*
Lichti, Robert D.; and Hock, Frederick D., 4,290,724, Cl. 414-251.000.

Hoechst Aktiengesellschaft: *See—*
Dost, Gunter; and Bauer, Fritz, 4,291,053, Cl. 424-283.000.
Nolken, Ernst, 4,290,930, Cl. 260-29.6MP.
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Strecker, Helmut; Molter, Michael; Kloss, Gerhard; and Schickel, Eberhard, 4,291,012, Cl. 424-1.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Martin, Lawrence L.; and Worm, Manfred, 4,290,958, Cl. 260-346.730.

Hoefer, Peter S.; and Whitesides, Michael, to Hoefer Scientific Instruments. Vertical gel slab electrophoresis method. 4,290,871, Cl. 204-180.00G.

Hoefer Scientific Instruments: *See—*
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Suchy, Milos, 4,291,058, Cl. 424-308.000.

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Price, Samuel T.; and Hoffsommer, Kay P., 4,290,177, Cl. 28-254.000.

Hofman, Johannes H. A.: *See—*
Schaafsma, Sijbrandus E.; Hofman, Johannes H. A.; and Claassens, Johannes E. L., 4,291,170, Cl. 560-126.000.

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Kobayashi, Tamotsu, 4,290,312, Cl. 73-861.120.

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Kagerhuber, Franz; and Holleis, Gunter, 4,290,478, Cl. 164-448.000.

Hollington, Geoffrey A.: *See—*
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Honda, Shoichi; and Watanabe, Nobuyoshi, 4,290,455, Cl. 137-855.000.
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Middel, Jan, 4,290,764, Cl. 493-395.000.

Hooke, John W., to General Electric Company. Battery linkage system. 4,291,106, Cl. 429-1.000.

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Dannels, W. Andrew; and Bainbridge, Robert W., 4,290,744, Cl. 425-543.000.

Hopkins, Harry C.; Goethert, Bernhard H.; and Power, Joseph K. Ground effect flying platform. 4,290,500, Cl. 180-117.000.

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Tanizaki, Yoshiharu; Minagawa, Kenichiro; Akimoto, Shinichi; and Horioka, Kuninori, 4,291,101, Cl. 428-514.000.

Horiuchi, Susumu; Hirano, Mikio; Yusa, Hideo; Chino, Koichi; and Hayashi, Tatsuo, to Hitachi, Ltd. Process for treating radioactive waste. 4,290,907, Cl. 252-301.10W.

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Pardue, James I., Jr.; Hornsby, William M.; and Noble, Henry J., III, 4,290,245, Cl. 52-157.000.

Horvath, Tibor, to Magyar Vagon- es Gepgyar. Hinge unit for articulated vehicles. 4,290,622, Cl. 280-400.000.

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De Feo, Angelo; and Hosek, William, 4,290,387, Cl. 122-4.00D.

Houston, Herbert J.: *See*—
Nigol, Olaf; Houston, Herbert J.; and Gretzinger, Adolf, 4,291,194, Cl. 174-40.00R.

Hozman, Nelson D.; Reynolds, Robert L.; and Kirn, Thomas G., to Eastman Kodak Company. Pressure member urging mechanism. 4,290,676, Cl. 354-121.000.

Hsu, Harry L.; Hardin, Edward E.; and Grindstaff, Lloyd I., to Great Lakes Carbon Corporation. Process for calcining and desulfurizing petroleum coke. 4,291,008, Cl. 423-461.000.

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Huchital, David A.: *See*—
Ausschnitt, Christopher P.; and Huchital, David A., 4,290,384, Cl. 118-722.000.

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Hudimac, George S., Jr., to Mechanical Service Company. Measuring apparatus for shot dispensers. 4,290,700, Cl. 366-76.000.

Hughes Aircraft Company: *See*—
Hamilton, James M.; and Carrison, Craig L., 4,291,243, Cl. 307-304.000.
Smolik, John V.; Swanson, Ronald V.; Rubin, Charles P.; Blaschke, James C.; and Wagner, Roger J., 4,290,570, Cl. 244-158.00R.
Young, Frederick A.; and Griffin, Edward L., 4,291,287, Cl. 333-210.000.
Young, Frederick A.; Griffin, Edward L.; and Hendrick, Louis W., 4,291,288, Cl. 333-212.000.

Huitema, Thomas W., to J. I. Case Company. Electronic transmission control. 4,290,322, Cl. 74-752.00A.

Hulse, David O., to Budd Company, The. Anti-lock system. 4,290,509, Cl. 188-181.00A.

Hund, Franz: *See*—
Schroeder, Gerhard; Buxbaum, Gunter; Hund, Franz; Schopper, Heinrich-Christian; and Naumann, Rolf, 4,290,799, Cl. 75-0.50A.

Huno, Takakazu: *See*—
Kodama, Kazuyuki; Okada, Kunihiro; Huno, Takakazu; Endo, Takeyuki; and Shibuya, Yasutaka, 4,291,306, Cl. 340-744.000.

Hurst, Gerald L. Method for producing enclosed multipaneled envelopes. 4,290,763, Cl. 493-341.000.

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Schad, Robert D., 4,290,701, Cl. 366-77.000.

Huston, Wilmer S.: *See*—
Twite, Terrance M.; and Huston, Wilmer S., 4,290,266, Cl. 60-641.200.

Hydra-Rig, Inc.: *See*—
Elliston, Thomas L., 4,290,495, Cl. 175-85.000.

Hydril Company: *See*—
Olson, Richard A., 4,290,577, Cl. 251-1.00A.

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Ichinose, Yoshito; Fukuda, Takeshi; and Kobayashi, Naoaki, to Fujitsu Limited. Process for producing bipolar semiconductor device utilizing predeposition of dopant and a polycrystalline silicon-gold film followed by simultaneous diffusion. 4,290,188, Cl. 29-591.000.

Ida, Masaru, to Nippon Gakki Seizo Kabushiki Kaisha. Equalizer amplifier. 4,291,276, Cl. 330-85.000.

Idelson, Elbert M. Color synthesizing. 4,290,699, Cl. 356-420.000.

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Ikeda, Kunio; and Haga, Hirosi, to Ricoh Co., Ltd. Method of forming fine bore. 4,290,857, Cl. 204-9.000.

Ikeda, Tomoaki: *See*—
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,291,119, Cl. 430-348.000.

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Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Portable radio frequency/channel display system. 4,291,412, Cl. 455-154.000.

Immorlica, Anthony A., Jr.: *See*—
Wen, Cheng P.; Kuvas, Reidar L.; and Immorlica, Anthony A., Jr., 4,291,320, Cl. 357-13.000.

Imperial Chemical Industries Limited: *See*—
Clifford, Michael L., 4,291,132, Cl. 525-53.000.
Porter, Kenneth, 4,290,278, Cl. 66-84.00A.

Inata, Hiroo; Matsumura, Shunichi; and Ogasawara, Makoto, to Teijin Limited. Process for producing aromatic polyesters having increased degrees of polymerization. 4,291,152, Cl. 528-289.000.

Indian Head Inc.: *See*—
Pate, Harold T., 4,290,572, Cl. 248-74.00B.

Indiana Wood Specialty, Inc.: *See*—
Snitzer, Morton; and Fehrenbacher, Gary L., 4,290,371, Cl. 108-159.000.

Industrial Metal Products Corporation: *See*—
Judge, Edward E., Jr., 4,290,238, Cl. 51-58.000.

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Zimmer, Ernst, 4,290,239, Cl. 51-126.000.

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Nogueira, Eduardo D.; Infanzon, Luis Alonso S.; and Tezanos, Enrique H., 4,290,863, Cl. 204-99.000.

Inland Steel Company: *See*—
Gaffney, LeRoy J., 4,290,984, Cl. 264-30.000.

Inoue Gomu Kogyo Kabushiki Kaisha: *See*—
Katoh, Hisanori, 4,291,076, Cl. 428-31.000.

Inoue, Hiroshi: *See*—
Sasaki, Yoshikazu; Inoue, Hiroshi; Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,290,936, Cl. 260-33.40P.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,290,856, Cl. 204-4.000.

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Inoue, Sadao; Umemura, Tetsuya; Suzuki, Hiroshi; and Tago, Makoto, to Furukawa Metals Company, Ltd. Copper alloy for reliable electrical connection. 4,290,806, Cl. 75-153.000.

Inoue, Yoshihiro: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, 4,291,010, Cl. 423-594.000.

Inouye, Naomitsu: *See*—
Funabiki, Kyohei; Matsushima, Noriaki; and Inouye, Naomitsu, 4,290,928, Cl. 260-28.00P.

Institut Francais du Petrole: *See*—
Aude, Robert; Baumgartner, Pierre; Desmarquest, Jean-Pierre; and Franck, Jean-Pierre, 4,290,973, Cl. 260-505.00R.
Sugier, Andre; and Freund, Edouard, 4,291,126, Cl. 518-713.000.

Insulation Materials, Inc.: *See*—
Kusenda, Stephen R., 4,290,250, Cl. 52-404.000.

Intermedics, Inc.: *See*—
Bihn, Daniel; and Gordon, Pat L., 4,290,430, Cl. 128-419.0PT.

International Business Machines Corporation: *See*—
Andros, Frank E.; Kerjilian, Ghazaros K.; Stevens, Bert E.; and Tomek, Reinhold E., 4,291,364, Cl. 361-384.000.
Bahl, Lalit R.; Cocke, John; Cullum, Clifton D., Jr.; and Hagenauer, Joachim, 4,291,406, Cl. 371-44.000.
Baumann, Gerald W., 4,290,596, Cl. 271-292.000.
Garwin, Richard L., 4,291,256, Cl. 315-368.000.
Hehl, Walter H., 4,290,356, Cl. 101-93.340.
Hofer, Donald C.; Kendrick, Raymond D.; and Yannoni, Costantino S., 4,291,272, Cl. 324-313.000.
Hong, Ju-Hi J., 4,291,357, Cl. 361-101.000.
King, Francis K.; and Wanek, Donald J., 4,291,350, Cl. 360-104.000.
Mizzi, John V., 4,291,315, Cl. 346-76.00R.
Pennell, George F.; Silkensen, Ralph D.; and Wallace, Joseph E., 4,291,351, Cl. 360-113.000.
Whitefield, Rodney J., 4,290,672, Cl. 350-358.000.

International Harvester Company: *See*—
Bowman, George E.; Faust, David S.; and Kataoka, David T., 4,290,623, Cl. 280-400.000.

International Standard Electric Corporation: *See*—
Chown, Martin, 4,290,667, Cl. 350-96.180.

International Telephone and Telegraph Corporation: *See*—
Burns, Edgar, 4,290,661, Cl. 339-18.00R.
Etcheverry, John P., 4,290,615, Cl. 277-221.000.
Friese, Egon F., 4,290,178, Cl. 29-33.00M.
Kruger, Bradford E., 4,291,310, Cl. 343-16.00R.
Peelle, Thomas B.; and Kolter, Roland K., 4,291,307, Cl. 340-756.000.

Investigacion Fic Fideicomiso: *See*—
Cabrera, Armando N., 4,290,795, Cl. 65-260.000.

Iowa State University Research Foundation, Inc.: *See*—
Demirel, Turgut; and Handy, Richard L., 4,290,252, Cl. 52-742.000.
Lupton, Harold W.; and Reed, David E., 4,291,019, Cl. 424-89.000.

Irie, Kazuo: *See*—
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Irrigation and Power Equipment, Inc.: *See*—
McConnell, Lloyd A., 4,290,556, Cl. 239-177.000.

Irvine, Robert, to Pitney Bowes Inc. Method for sheet feeding. 4,290,593, Cl. 271-42.000.

Isakson, Larry E., to Midland-Ross Corporation. Hydraulic booster valve. 4,290,342, Cl. 91-391.00R.

Ishibashi, Satoshi: *See*—
Sueoka, Tetsuro; and Ishibashi, Satoshi, 4,291,325, Cl. 357-38.000.

Ishida, Hiroshi: *See*—
Kawada, Shigeki; Ishida, Hiroshi; and Sakamoto, Keiji, 4,291,265, Cl. 318-782.000.
Ishii, Eiji: *See*—
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, 4,291,253, Cl. 313-348.000.
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Matsui, Kunio; Tsuchiya, Hiroaki; Suzuki, Ryushi; and Omura, Takayoshi, 4,290,791, Cl. 55-399.000.
Isono, Kunihiro: *See*—
Kishino, Shigeo; Saito, Junichi; Kume, Toyohiko; and Isono, Kunihiro, 4,290,978, Cl. 260-973.000.
Itatani, Hiroshi: *See*—
Sasaki, Yoshikazu; Inoue, Hiroshi; Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,290,936, Cl. 260-33.40P.
Ito, Senji; and Suzuki, Kenji, to Toyo Seikan Kaisha Limited. Packaging material for food to be subjected to high-temperature short-time sterilization and process for the preparation thereof. 4,291,085, Cl. 428-215.000.
Ito, Teruyoshi: *See*—
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.
Ito, Tsunetoshi: *See*—
Takahashi, Ken; and Ito, Tsunetoshi, 4,290,648, Cl. 299-1.000.
ITT Industries, Inc.: *See*—
Klein, Otto, 4,290,191, Cl. 29-597.000.
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Morel, Henri, 4,290,536, Cl. 220-359.000.
Ivanchev, Sergei S.: *See*—
Syrov, Anatoly A.; Ivanchev, Sergei S.; Primachenko, Oleg N.; Demidova, Valentina A.; Polozov, Boris V.; Fionov, Vladimir I.; and Barantsevich, Evgeny N., 4,290,945, Cl. 260-192.000.
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Iwai, Hiroshi: *See*—
Nakate, Yasushi; Iwai, Hiroshi; and Nanishi, Kiyoshi, 4,291,137, Cl. 525-162.000.
Iwamoto, Tsuneo. Method for eliminating ammonia nitrogen from sewage. 4,290,895, Cl. 210-669.000.
Iwasaki, Takashiro: *See*—
Kanemaru, Kenji; and Iwasaki, Takashiro, 4,291,297, Cl. 340-347.0AD.
Iyoda, Michio; and Abe, Shigeya, to Nippondenso Co., Ltd. Ignition system for internal combustion engine. 4,290,406, Cl. 123-645.000.
Izdebski, Jerzy. Pick-up for a musical instrument. 4,290,331, Cl. 84-1.140.
J. I. Case Company: *See*—
Huitema, Thomas W., 4,290,322, Cl. 74-752.00A.
Jackson, David E.: *See*—
Girgis, Makram M.; Jackson, David E.; and Mannuzza, Frank J., 4,290,774, Cl. 23-230.00B.
Jackson, Robert W., to Bendix Corporation, The. Ball joint forming method and apparatus therefor. 4,290,181, Cl. 29-458.000.
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with 1-(azol-1-yl)-2-substituted-alken-3-ones. 4,291,044, Cl. 424-269.000.
Jahnle, Herbert A.; and Freeman, Richard B., to Budd Company, The. Intrusion resisting strap for automobile doors. 4,290,235, Cl. 49-502.000.
Jaklevic, Robert C.: *See*—
Gaerttner, Martin R.; and Jaklevic, Robert C., 4,290,861, Cl. 204-56.00R.
Jameikis, Saulius M.; Stalcup, Robert K.; Arnold, Joe F.; and Hon, Robert K., to United Technologies Corporation. Fixture for use in forming cylindrical surfaces of accurate dimension. 4,290,237, Cl. 51-34.00A.
Janata, Jiri: *See*—
Horak, Vaclav; and Janata, Jiri, 4,291,133, Cl. 525-74.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,290,377, Cl. 112-158.00E.
Tonomura, Yoshinobu; Fujimura, Toshio; Hara, Masanori; and Takenoya, Hideaki, 4,290,375, Cl. 112-121.120.
Janoski, Florian B., to Atlas Powder Company. Energy transmission device. 4,290,366, Cl. 102-202.300.
Jayant, Nuggehally S.; Schmidt, Carolyn E.; and Steele, Raymond, to Bell Telephone Laboratories, Incorporated. Error reduction speech communication system. 4,291,405, Cl. 371-31.000.
Jensen, Ragnar, Jr. Collapsible boat. 4,290,157, Cl. 9-2.00C.
Jet Research Center, Inc.: *See*—
Regalbuto, John A., 4,290,486, Cl. 166-297.000.
Jewett, Warren R., to Vita Vet Research Group Inc. Blood pressure measuring device. 4,290,434, Cl. 128-680.000.
Joeres, Helmut: *See*—
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Johanns, Johannes H. M.: *See*—
Bijma, Jan; Joeres, Helmut; and Johanns, Johannes H. M., 4,291,251, Cl. 313-413.000.
Johansson, Eric G. B., to AB Svenska Flaktfabriken. Device for drying web material. 4,290,210, Cl. 34-156.000.
Johansson, Jan, to Renholmens Mekaniska Verkstad AB. Timber package arranger. 4,290,723, Cl. 414-83.000.
John Wyeth & Brother Limited: *See*—
Ward, Terence J., 4,291,042, Cl. 424-267.000.
Johns-Manville Corporation: *See*—
de Muinck, Andre R., 4,290,749, Cl. 432-13.000.
Johnson, James R.; and Flanagan, William C., Jr., to Minnesota Mining and Manufacturing Company. Multishell microcapsules. 4,290,847, Cl. 176-1.000.
Johnson, Porter C.; and Matier, William L., to Mead Johnson & Company. Silylated indanyloxyacetates. 4,291,168, Cl. 556-441.000.
Johnson, Richard D. Gas scrubber and method. 4,290,782, Cl. 55-60.000.
Johnson, Walter R.; and Petaja, Gary M., to American Telecommunications Corporation. Push-button dial assembly for telephones. 4,291,201, Cl. 179-90.00K.
Johnson, Weldon K., to Kerr-McGee Coal Corporation. Particulate material transfer system. 4,290,725, Cl. 414-329.000.
Johnston, Stephen P., to S. J. Electro Systems, Inc. Electrical load control circuit useful in liquid level control systems. 4,291,261, Cl. 318-482.000.
Johnstone, Frank, to Carco Accessories Limited. Automatic temperature compensated boiler thermostat. 4,290,551, Cl. 236-9.00R.
Jones, John H.; and Dewey, Lloyd P., to Jones, John H. Rack for boat fenders. 4,290,529, Cl. 211-13.000.
Jones, Stephen G. B.: *See*—
Brown, Arthur D.; and Jones, Stephen G. B., 4,290,887, Cl. 210-242.100.
Jones, Terry L.; and Miller, Brian S., to United States of America, Army. Method of making semiconductor photodetector with reduced time-constant. 4,291,068, Cl. 427-88.000.
Jost, Heinz: *See*—
Pennewiss, Horst; Benda, Rainer; Jost, Heinz; and Knoell, Helmuth, 4,290,925, Cl. 252-56.00S.
Judge, Edward E., Jr., to Industrial Metal Products Corporation. Universal crankshaft finishing machine. 4,290,238, Cl. 51-58.000.
Jueschke, Alexander A.: *See*—
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,290,865, Cl. 204-106.000.
Juett, George C.; and Rez, Donald H., to Rez, Donald H.; and Rez, Betty. Refractory lattice and fabrication. 4,290,408, Cl. 126-25.00R.
Jumer, John F. Means for and method of producing smooth electro-polished surfaces. 4,290,867, Cl. 204-129.350.
Jungermann, Eric: *See*—
Poper, Maxwell H.; and Jungermann, Eric, 4,290,904, Cl. 252-118.000.
Juzi, Heinz, to Sulzer Brothers Limited. Steam generator. 4,290,390, Cl. 122-406.00S.
Jwi Ltd.: *See*—
Buchanan, John G.; and MacBean, Donald G., 4,290,209, Cl. 34-123.000.
Kabashima, Katsuhiko: *See*—
Nakano, Masao; Nakano, Tomio; Takemae, Yoshihiro; and Kabashima, Katsuhiko, 4,291,394, Cl. 365-206.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Masuda, Shigeyuki, 4,291,398, Cl. 368-37.000.
Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Okubo, Kunio, 4,290,790, Cl. 55-379.000.
Kabushiki-Kaisha K I P: *See*—
Noda, Nobutaka; Hamamura, Kazuo; and Morita, Yoichi, 4,290,690, Cl. 355-3.00R.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Sakashita, Masao, 4,290,333, Cl. 84-1.240.
Kabushiki Kaisha Meidensha: *See*—
Sueoka, Tetsuro; and Ishibashi, Satoshi, 4,291,325, Cl. 357-38.000.
Kabushiki Kaisha Plastic Kogaku Kenkyusho: *See*—
Murakami, Kenkichi; and Kikuzawa, Yoshiharu, 4,290,994, Cl. 264-515.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Kanbe, Sadao, 4,290,905, Cl. 252-299.630.
Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. Method for sealing cation exchange membranes of carboxylic acid type fluorinated polymers. 4,290,833, Cl. 156-94.000.
Kadota, Michio, to Murata Manufacturing Co., Ltd. Surface acoustic wave device and method of manufacturing. 4,291,285, Cl. 333-150.000.
Kaeding, Warren W., to Mobil Oil Corporation. Alkylation of benzene in petroleum. 4,291,185, Cl. 585-467.000.
Kagerhuber, Franz; and Holleis, Gunter, to Voest-Alpine Aktiengesellschaft. Guiding stand to be used in a continuous casting plant. 4,290,478, Cl. 164-448.000.
Kagota, Nobuhiro: *See*—
Tsukahara, Hirokazu; Fuchigami, Mitsuru; and Kagota, Nobuhiro, 4,291,102, Cl. 428-537.000.
Kahl, Melvin R., to Envirotech Corporation. Bottom-powered electrostatic precipitator. 4,290,787, Cl. 55-120.000.
Kakeno, Sadao; Hayashi, Taisen; Komai, Hiromichi; and Yamazaki, Hiroshi, to Ricoh Co., Ltd. System for driving ink drop generator of ink-jet printer. 4,291,316, Cl. 346-140.00R.
Kalden, Bernhard: *See*—
Fritz, Rolf; Kalden, Bernhard; and Kissel, Karl-Friedrich, 4,290,852, Cl. 176-58.0PB.
Kalleberg, Melvin O., to Minnesota Mining and Manufacturing Company. Separable fastener and article for making same. 4,290,174, Cl. 24-204.000.

Kalleberg, Melvin O., to Minnesota Mining and Manufacturing Company. Method for making fasteners. 4,290,832, Cl. 156-72.000.

Kaloi, Cyril M., to United States of America, Navy. Dual ground plane microstrip antennas. 4,291,311, Cl. 343-700.0MS.

Kaloi, Cyril M., to United States of America, Navy. Dual ground plane coplanar fed microstrip antennas. 4,291,312, Cl. 343-700.0MS.

Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, to Mitsubishi Rayon Co., Ltd. Scratch-resistant, dyeable coating compositions for synthetic resin articles. 4,291,097, Cl. 428-412.000.

Kamano, Yoshiaki: *See*—
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, 4,290,962, Cl. 260-397.450.

Kamimaru, Nobuyuki: *See*—
Suzuki, Yasoji; and Kamimaru, Nobuyuki, 4,291,274, Cl. 328-133.000.

Kaminsky, Yaroslav: *See*—
Weinberg, Aaron; Ebert, Paul M.; Fee, Joseph J.; Kaminsky, Yaroslav; Keblawi, Feisal S.; and Scales, Walter C., 4,291,409, Cl. 375-1.000.

Kamon, Yoshiyuki; and Kishikami, Jun, to Sony Corporation. Laminated loudspeaker diaphragm with honeycomb core and damping layers. 4,291,205, Cl. 179-181.00R.

Kanaga, Amos R.; and Kanaga, Stephen R. Cover for food serving dishes. 4,290,546, Cl. 229-43.000.

Kanaga, Stephen R.: *See*—
Kanaga, Amos R.; and Kanaga, Stephen R., 4,290,546, Cl. 229-43.000.

Kanamaru, Hisanobu; Tatsumi, Hideo; Tohkairin, Akira; and Sayo, Kosaku, to Hitachi, Ltd. Method of making V-grooved pulley assembly. 4,290,295, Cl. 72-356.000.

Kanbe, Sadao, to Kabushiki Kaisha Suwa Seikosha. Ester compound. 4,290,905, Cl. 252-299.630.

Kane, William T.; and Whitney, William P., II, to Corning Glass Works. Furnace and method with sensor. 4,290,586, Cl. 266-80.000.

Kanebo Ltd.: *See*—
Oeda, Ichiro; and Sano, Isao, 4,291,018, Cl. 424-64.000.

Kaneko, Hideo: *See*—
Murakami, Keikichi; and Kaneko, Hideo, 4,290,306, Cl. 73-354.000.

Kanemaru, Kenji; and Iwasaki, Takashiro, to Hitachi, Ltd. Single ramp comparison analog to digital converter. 4,291,297, Cl. 340-347.0AD.

Kang, Kenneth S.; and Veeder, George T., to Merck & Co., Inc. Polysaccharide S-53 and bacterial fermentation process for its preparation. 4,291,156, Cl. 536-1.000.

Kansai Paint Co., Ltd.: *See*—
Nakate, Yasushi; Iwai, Hiroshi; and Nanishi, Kiyoshi, 4,291,137, Cl. 525-162.000.

Kanto Seiki Company, Limited: *See*—
Okuyama, Hideo, 4,291,268, Cl. 324-76.00R.

Kanzawa, Ryosaku: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.

Kapoor, Vinod, to Butler Greenwich Inc. Dampening assembly. 4,290,359, Cl. 101-148.000.

Karkoski, Joseph: *See*—
McGregor, Charles W.; Karkoski, Joseph; and Shurboff, John D., 4,290,929, Cl. 260-29.20N.

Karlsson, Hans I. R. Spring-operated reversably rotatable body. 4,290,564, Cl. 242-107.000.

Karrer, Friedrich: *See*—
Meyer, Willy; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; and Karrer, Friedrich, 4,291,056, Cl. 424-304.000.

Kashima, Mikito: *See*—
Sasaki, Yoshikazu; Inoue, Hiroshi; Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,290,936, Cl. 260-33.40P.

Kashioka, Seiji: *See*—
Mese, Michihiro; Kashioka, Seiji; Ejiri, Masakazu; Miyatake, Takafumi; Yamazaki, Isamu; and Hamada, Toshimitsu, 4,291,334, Cl. 358-101.000.

Kashiwa, Norio: *See*—
Toyota, Akinori; and Kashiwa, Norio, 4,290,915, Cl. 252-429.00B.

Kasper, Rudolf: *See*—
Elsner, Emil; Kasper, Rudolf; and Schwabe, William E., 4,291,190, Cl. 13-18.00R.

Kastner, Arnold. Apparatus for paper interleaving and severing. 4,290,592, Cl. 270-40.000.

Kataoka, David T.: *See*—
Bowman, George E.; Faust, David S.; and Kataoka, David T., 4,290,623, Cl. 280-400.000.

Kato, Kenji: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,290,377, Cl. 112-158.00E.

Kato, Masaaki; and Ogi, Keisuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Phase-locked circuit. 4,291,332, Cl. 358-19.000.

Kato, Shoji: *See*—
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, 4,291,253, Cl. 313-348.000.

Kato, Suehiro: *See*—
Nishiyama, Hiroshi; Nakamura, Takeshi; Kato, Suehiro; and Ando, Kenji, 4,290,876, Cl. 204-298.000.

Kato, Takeo: *See*—
Takahashi, Yasunobu; Fujimoto, Einosuke; Shimizu, Toshio; and Kato, Takeo, 4,290,946, Cl. 260-239.00B.

Katoh, Hisanori, to Inoue Gomu Kogyo Kabushiki Kaisha. Trim molding strips for a vehicle. 4,291,076, Cl. 428-31.000.

Katsumata, Seiji: *See*—
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.

Katzen, Stanley J.; and Rekers, Louis J., to National Petro Chemicals Corp. Catalytic materials as for olefin polymerization. 4,290,914, Cl. 252-428.000.

Kavesh, Sheldon: *See*—
Smith, Robert W.; Hemmat, Naim S.; Bedell, John R.; Kavesh, Sheldon; and Draizen, Seymour, 4,290,476, Cl. 164-423.000.

Kawabe, Ushio: *See*—
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.

Kawada, Shigeki; Ishida, Hiroshi; and Sakamoto, Keiji, to Fujitsu Fanuc Limited. Protective system for inverter circuit used in driving AC motors. 4,291,265, Cl. 318-782.000.

Kawai, Mitsuo: *See*—
Aisaka, Tatsuyoshi; Kawai, Mitsuo; Mori, Fumio; and Sugai, Shinzo, 4,290,828, Cl. 148-11.50Q.

Kawakami, Kanji: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.

Kawakubo, Mitsushige; Sakai, Yoshihiro; and Ohno, Akira, to NHK Spring Co., Ltd. Device for narrowing the breadth of a sheet spring material in an apparatus for manufacturing a taper leaf spring. 4,290,288, Cl. 72-7.000.

Kawamura, Kiyoshi: *See*—
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.

Kawamura, Masaharu: *See*—
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,290,686, Cl. 354-289.000.

Kawamura, Takao: *See*—
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Murakami, Keikichi; and Kaneko, Hideo, 4,290,306, Cl. 73-354.000.

Kawase, Kazuo: *See*—
Maehara, Toshifumi; and Kawase, Kazuo, 4,290,265, Cl. 60-561.000.

Kawashima, Kenichi; Yasuda, Hiroshi; and Uema, Kenyu, to Fujitsu Limited. Electron beam exposure system and an apparatus for carrying out the same. 4,291,231, Cl. 250-492.00A.

Kawneer Company, Inc.: *See*—
Hubbard, S. Eugene, 4,290,233, Cl. 49-383.000.

Kay, David P.: *See*—
Barnes, Alan C.; and Kay, David P., 4,291,033, Cl. 424-250.000.

Kayser, Franz: *See*—
Pav, Josef; Kayser, Franz; and Kemna, Axel, 4,290,351, Cl. 100-47.000.

Kazuo, Katsube: *See*—
Kenji, Fujisawa; Kazuo, Katsube; Tadataka, Yako; Koich, Uemura; Yuichi, Harada; and Yasumasa, Sakai, 4,291,090, Cl. 428-327.000.

Keblawi, Feisal S.: *See*—
Weinberg, Aaron; Ebert, Paul M.; Fee, Joseph J.; Kaminsky, Yaroslav; Keblawi, Feisal S.; and Scales, Walter C., 4,291,409, Cl. 375-1.000.

Keifert, Hibbard G., to Fansteel Inc. Brazed corrosion resistant lined equipment. 4,291,104, Cl. 428-594.000.

Keiper Automobiltechnik GmbH & Co. K.G.: *See*—
Hensel, Wolfgang; Berghof, Hans-Joachim; and Werner, Heinz, 4,290,647, Cl. 297-362.000.

Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing estradiol diacetate. 4,291,014, Cl. 424-28.000.

Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing a vasodilator. 4,291,015, Cl. 424-28.000.

Keller, Manfred: *See*—
Brause, Joachim; Gerhard, Thomas; Keller, Manfred; and Olszok, Henry, 4,290,367, Cl. 104-105.000.

Kellman, Louis C.: *See*—
Valeriote, Michael A.; Kellman, Louis C.; and Brandigampola, Don E., 4,291,284, Cl. 333-17.00M.

Kelsey, Thomas: *See*—
Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., 4,291,208, Cl. 200-148.00A.

Kemerer, William J.; and Vassar, Clyde W., to Kemerer, William James. Continuous process for forming products from thermoplastic polymeric material having three-dimensional patterns and surface textures. 4,290,248, Cl. 52-309.160.

Kemerer, William James: *See*—
Kemerer, William J.; and Vassar, Clyde W., 4,290,248, Cl. 52-309.160.

Kemna, Axel: *See*—
Pav, Josef; Kayser, Franz; and Kemna, Axel, 4,290,351, Cl. 100-47.000.

Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, to BASF Aktiengesellschaft. Polyadducts of ammonia and epoxide compounds, processes for their modification, and their use. 4,291,147, Cl. 528-119.000.

Kendrick, Raymond D.: *See*—
Hofer, Donald C.; Kendrick, Raymond D.; and Yannoni, Costantino S., 4,291,272, Cl. 324-313.000.

Kenji, Fujisawa; Kazuo, Katsube; Tadataka, Yako; Koich, Uemura; Yuichi, Harada; and Yasumasa, Sakai. Heat sealable plastic films coated with a coating composition. 4,291,090, Cl. 428-327.000.

Kennedy, Richard B., to Crehan, Patrick James.; and Fricke, Richard J., part interest to each. Composition and a method for controlling reaction pressures during the foaming process resulting in an easily flame retarded foam-in place insulation. 4,291,129, Cl. 521-103.000.

Kennedy, Robert B. Sports field barrier and method of constructing same. 4,290,602, Cl. 273-29.00R.

Keogh, Michael J., to Union Carbide Corporation. Water-curable silane modified alkylene alkylacrylate copolymer and a process for its production. 4,291,136, Cl. 525-102.000.

Kerb, Ulrich: *See*—
Schulze, Paul-Eberhard; and Kerb, Ulrich, 4,290,963, Cl. 260-397.450.
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Prezewowsky, Klaus; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,291,029, Cl. 424-238.000.

Kerjilian, Ghazaros K.: *See*—
Andros, Frank E.; Kerjilian, Ghazaros K.; Stevens, Bert E.; and Tomek, Reinhold E., 4,291,364, Cl. 361-384.000.

Kern Instruments, Inc.: *See*—
Wehrli, Hans J.; and Roberts, Timothy P., 4,290,694, Cl. 356-2.000.

Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung: *See*—
Stocklin, Gerhard; Laufer, Peter; and Machulla, Jurgen, 4,290,965, Cl. 260-408.000.

Kerr-McGee Chemical Corporation: *See*—
Arnold, Donald S.; Fairchild, James L.; Nichols, Donald A.; and Coe, Merlin D., 4,291,002, Cl. 423-189.000.

Kerr-McGee Coal Corporation: *See*—
Johnson, Weldon K., 4,290,725, Cl. 414-329.000.

Kerr-McGee Refining Corporation: *See*—
Leonard, Robert E., 4,290,880, Cl. 208-309.000.

Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Injection moldable amide imide copolymers and terpolymers. 4,291,149, Cl. 528-188.000.

Kesselman, Joseph J., Sr. On-off snap action water and energy saving valve attachment for sink spout. 4,290,152, Cl. 4-191.000.

Kessler, Sebastian W., Jr.; and Olmstead, John A., to RCA Corporation. Semiconductor power device having second breakdown protection. 4,291,324, Cl. 357-36.000.

Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,291,014, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, 4,291,015, Cl. 424-28.000.

Khvostantsev, Lev G.: *See*—
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Recording material. 4,291,119, Cl. 430-348.000.

Kidon, William E.: *See*—
Shuster, Nicholas; Babinsky, Andrew D.; and Kidon, William E., 4,290,864, Cl. 204-103.000.

Kiene, Wilfried: *See*—
Appel, Eggert; Nissen, Peter; Geisler, Gottfried; and Kiene, Wilfried, 4,290,313, Cl. 73-861.170.

Kienzle Apparate GmbH: *See*—
Dold, Berthold, 4,291,313, Cl. 346-68.000.

Kiikka, Oliver A., to Standard Oil Company. Co-production of indene and styrene. 4,291,180, Cl. 585-320.000.

Kiikka, Oliver A.; and Li, George S., to Standard Oil Company. Indenes from tetrahydroindenes. 4,291,181, Cl. 585-320.000.

Kikuzawa, Yoshiharu: *See*—
Murakami, Kenkichi; and Kikuzawa, Yoshiharu, 4,290,994, Cl. 264-515.000.

Kimura, Kenji, to Olympus Optical Company Limited. Time base correcting system. 4,291,344, Cl. 360-36.000.

Kimura, Seishi: *See*—
Hiraga, Masaharu; and Kimura, Seishi, 4,290,345, Cl. 92-79.000.

Kimura, Shigenobu, to Nippon Gakki Seizo Kabushiki Kaisha. Radio receiver operable in station search mode or station select mode. 4,291,414, Cl. 455-164.000.

Kimura, Tsutomu; Miyoshi, Hitoshi; and Mori, Sumio, to Fuji Photo Film Co., Ltd. Method for generating format lines and character data in an image scanning system. 4,291,305, Cl. 340-734.000.

King, Francis K.; and Wanek, Donald J., to International Business Machines Corporation. Spring suspension for magnetic transducer. 4,291,350, Cl. 360-104.000.

King, Gordon A.; Nimmo, George R.; and Bial, Wolfgang. Lamp monitoring circuits. 4,291,302, Cl. 340-642.000.

Kioritz Corporation: *See*—
Hiramatsu, Kenzo; and Aiyama, Fumihiko, 4,290,165, Cl. 15-330.000.

Kirn, Thomas G.: *See*—
Hozman, Nelson D.; Reynolds, Robert L.; and Kirn, Thomas G., 4,290,676, Cl. 354-121.000.

Kirschbaum, Herbert S., to Westinghouse Electric Corp. Wind turbine-generator. 4,291,233, Cl. 290-1.00C.

Kirtley, James L., Jr.: *See*—
Smith, Joseph L., Jr.; and Kirtley, James L., Jr., 4,291,249, Cl. 310-214.000.

Kise, Yaeko. Badge with pin. 4,290,215, Cl. 40-1.500.

Kishikami, Jun: *See*—
Kamon, Yoshiyuki; and Kishikami, Jun, 4,291,205, Cl. 179-181.00R.

Kishino, Shigeo; Saito, Junichi; Kume, Toyohiko; and Isono, Kunihiro, to Nihon Tokushu Noyasu Seizo K.K. Production of phosphoro chloride thiolates. 4,290,978, Cl. 260-973.000.

Kishu Neji Co., Ltd.: *See*—
Nakae, Isoji, 4,290,469, Cl. 411-185.000.

Kissel, Karl-Friedrich: *See*—
Fritz, Rolf; Kalden, Bernhard; and Kissel, Karl-Friedrich, 4,290,852, Cl. 176-58.0PB.

Kita, Yuzo: *See*—
Mayama, Koichi; Yamaguchi, Noboru; Sugie, Mamoru; Kita, Yuzo; and Yoshizawa, Shigeru, 4,291,241, Cl. 307-269.000.

Kitano, Takio, to Nippondenso Co., Ltd. Anti-theft system for automotive vehicles. 4,291,237, Cl. 307-10.0AT.

Kitaoka, Yoji: *See*—
Morita, Minoru; Sato, Shimio; Hashimoto, Takao; and Kitaoka, Yoji, 4,290,999, Cl. 422-194.000.

Kitchin, Peter W.: *See*—
White, Roy L.; Leevers, David F. A.; and Kitchin, Peter W., 4,290,538, Cl. 222-25.000.

Kizer, Richard W.; Anderson, Arlynn W.; and Untz, Robert W., to Caterpillar Tractor Co. Method of forming the mounting portion of a sidewall protector. 4,290,990, Cl. 264-156.000.

Klefisch, Rudolf. Heat treating basket. 4,290,753, Cl. 432-261.000.

Klein, Imrich: *See*—
Klein, Reuben; and Klein, Imrich, 4,290,702, Cl. 366-77.000.

Klein, Otto, to ITT Industries, Inc. Method for making a commutator for an electric motor. 4,290,191, Cl. 29-597.000.

Klein, Reuben; and Klein, Imrich, to Scientific Process & Research, Inc. Plasticating apparatus for molding devices. 4,290,702, Cl. 366-77.000.

Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., to National Semiconductor Corp. Method of making integrated semiconductor structure having an MOS and a capacitor device. 4,290,186, Cl. 29-576.00B.

Kleinewefers GmbH: *See*—
Pav, Josef; Kayser, Franz; and Kemna, Axel, 4,290,351, Cl. 100-47.000.
Pav, Josef; and Pav, Josef, 4,290,353, Cl. 100-162.00B.

Kleinschnitz, Donald J., Jr. Moving exposure system. 4,290,689, Cl. 355-1.000.

Kleinwolterink, Henry, to Main-Tainer Corporation. Paraplegic stand having a lift mechanism. 4,290,423, Cl. 128-80.00G.

Klicker, James D.: *See*—
Hechenbleikner, Ingenuin; Klicker, James D.; and Enlow, William P., 4,290,976, Cl. 260-973.000.

Klingensmith, Chester H.: *See*—
McMonigle, Matthew J.; and Klingensmith, Chester H., 4,290,874, Cl. 204-243.00R.

Klockner-Humboldt-Deutz AG: *See*—
Kryczun, Alfred; and Manshausen, Theodor, 4,290,801, Cl. 75-21.000.

Kloss, Gerhard: *See*—
Strecker, Helmut; Molter, Michael; Kloss, Gerhard; and Schickel, Eberhard, 4,291,012, Cl. 424-1.000.

Klothen, Irving: *See*—
Tobkes, Martin; Dann, Murray; Klothen, Irving; Spicer, Larry D.; and Williams, David R., 4,291,026, Cl. 424-181.000.

Klovsky, Yakov A.: *See*—
Krasnov, Valery A.; Klovsky, Yakov A.; Dubov, Igor V.; Shtern, Arkady V.; Vyatkin, Viktor L.; and Shavelzon, Lev A., 4,290,665, Cl. 339-276.00T.

Klyachko, Lev I.: *See*—
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Knaack, Howard L.; and Weger, Kenneth F., Jr., to Knaack Manufacturing Company. Lock system. 4,290,281, Cl. 70-54.000.

Knaack Manufacturing Company: *See*—
Knaack, Howard L.; and Weger, Kenneth F., Jr., 4,290,281, Cl. 70-54.000.

Knoch, Wolfgang: *See*—
Nopper, Herbert; and Knoch, Wolfgang, 4,290,988, Cl. 264-112.000.

Knoell, Helmuth: *See*—
Pennewiss, Horst; Benda, Rainer; Jost, Heinz; and Knoell, Helmuth, 4,290,925, Cl. 252-56.00S.

Knoll, Fritz. Tool holder assembly for a portable power tool. 4,290,721, Cl. 409-234.000.

Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Pyrido[1,2-A]pyrimidine derivatives and method of analgesic treatment. 4,291,036, Cl. 424-251.000.

Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Preparation of novel

fungicidally active spiro derivatives of 3-(3,5-dihalogenophenyl)-oxazolidine-2-thion-4-ones. 4,291,046, Cl. 424-272.000.
Knott, John; and Elliott, Robert V., to EMI Limited. Magnetic tape handler. 4,290,566, Cl. 242-189.000.
Knowles, Steven M., to Aeroquip Corporation. Valve with frangible closure. 4,290,276, Cl. 62-299.000.
Knutson, Dale, to Dynex/Rivett Inc. Electrohydraulic proportional valve. 4,290,447, Cl. 137-596.200.
Kobayashi, Naoaki: *See*—
Ichinose, Yoshito; Fukuda, Takeshi; and Kobayashi, Naoaki, 4,290,188, Cl. 29-591.000.
Kobayashi, Tamotsu, to Hokushin Electric Works, Ltd. Signal generator for electromagnetic flowmeter. 4,290,312, Cl. 73-861.120.
Kobayashi, Tomoyuki; Usami, Toshimasa; Misu, Hiroshi; and Sera, Hidefumi, to Fuji Photo Film Co., Ltd. Heat developable photosensitive material. 4,291,120, Cl. 430-531.000.
Kobler, Ingo; Mamberer, Hans; and Zwosta, Helge, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inking system for a printing machine, particularly of the offset or gravure type. 4,290,362, Cl. 101-350.000.
Kobler, Ingo, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inking system for a printing machine. 4,290,363, Cl. 101-351.000.
Kobori, Shigeyuki: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.
Kobori, Toshio; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Apparatus for establishing automatic exposure control modes in exchangeable lens camera. 4,290,674, Cl. 354-38.000.
Kockerols, Erhard; and Sagemuller, Albert, to Thyssen Industrie AG. Method and apparatus for generating a controlled current flow and waves in a water pool. 4,290,153, Cl. 4-491.000.
Kodama, Kazuyuki; Okada, Kunihiro; Huno, Takakazu; Endo, Takeyuki; and Shibuya, Yasutaka, to Hitachi, Ltd. Figure displaying device. 4,291,306, Cl. 340-744.000.
Koehler, Toivo: *See*—
Rotolante, Ralph A.; and Koehler, Toivo, 4,290,844, Cl. 156-630.000.
Kohno, Yoshio: *See*—
Tanaka, Chiaki; Morikawa, Masanobu; and Kohno, Yoshio, 4,290,927, Cl. 260-3.000.
Koich, Uemura: *See*—
Kenji, Fujisawa; Kazuo, Katsube; Tadataka, Yako; Koich, Uemura; Yuichi, Harada; and Yasumasa, Sakai, 4,291,090, Cl. 428-327.000.
Koida, Yoshiyuki: *See*—
Harada, Kiyoshi; Koida, Yoshiyuki; and Miura, Hiroshi, 4,290,910, Cl. 252-312.000.
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, to Chugai Seiyaku Kabushiki Kaisha. Benzoxazepine derivatives and process for preparing the same. 4,290,953, Cl. 260-333.000.
Kolbel, Gert F., to Compret N.V. Push-pull physical exercising device. 4,290,600, Cl. 272-137.000.
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P. Device for building-up high pressure. 4,290,741, Cl. 425-77.000.
Kolf, Heinrich: *See*—
Fischer, Klaus H.; Kroschel, Heinz; and Kolf, Heinrich, 4,290,637, Cl. 294-83.00A.
Kolter, Roland K.: *See*—
Peelle, Thomas B.; and Kolter, Roland K., 4,291,307, Cl. 340-756.000.
Komai, Hiromichi: *See*—
Kakeno, Sadao; Hayashi, Taisen; Komai, Hiromichi; and Yamazaki, Hiroshi, 4,291,316, Cl. 346-140.00R.
Komatsu, Kazurou; Matsumoto, Sojiro; Maniwa, Takeshi; and Shinmura, Nobuyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the continuous production of polyisocyanate. 4,290,969, Cl. 260-453.0AB.
Komiyama, Katsuhiko; and Hiruta, Toshio, to Citizen Watch Co. Ltd. Electronic timepiece. 4,291,400, Cl. 368-84.000.
Kommandiittiyhtio Finnpipette Osma A. Suovaniemi: *See*—
Suovaniemi, Osmo A., 4,290,997, Cl. 422-73.000.
Konagaya, Yoshiaki: *See*—
Suwa, Toshio; Konagaya, Yoshiaki; and Ishii, Hiroshi, 4,290,555, Cl. 239-8.000.
Kondoh, Syunichi; Matsufuji, Akihiro; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Photopolymerizable compositions. 4,290,870, Cl. 204-159.150.
Konen, Heinz: *See*—
Ibach, Adolf; and Konen, Heinz, 4,290,326, Cl. 76-101.00R.
Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Wolff, Per L., 4,291,088, Cl. 428-313.000.
Konishi, Akira: *See*—
Ogawa, Mutsuo; Murayama, Noboru; Konishi, Akira; and Takeuchi, Norisada, 4,291,339, Cl. 358-260.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Yajima, Tatsuo, 4,291,341, Cl. 358-300.000.
Konstantinova, Kina V.: *See*—
Georgiev, Atanas G.; Andreev, Kino D.; and Konstantinova, Kina V., 4,290,971, Cl. 260-453.500.
Kontz, Robert F., to Owens-Illinois, Inc. Apparatus for blow molding. 4,290,745, Cl. 425-541.000.
Konucik, George J.: *See*—
McLennan, Charles I.; Stokes, Marshall G.; and Konucik, George J., 4,290,159, Cl. 9-9.000.
Konucik, George Joseph: *See*—
McLennan, Charles I.; Stokes, Marshall G.; and Konucik, George J., 4,290,159, Cl. 9-9.000.
Korenstein, Ralph; and Castro, Carlos A., to Texas Instruments Incorporated. Epitaxial growth of magnetic memory film on implanted substrate. 4,290,843, Cl. 156-628.000.
Korf & Fuchs Systemtechnik GmbH: *See*—
Elsner, Emil; Kasper, Rudolf; and Schwabe, William E., 4,291,190, Cl. 13-18.00R.
Korse, Theodorus H., to Korse, Theodorus H. Helical gear pump or gear motor with optimal relief grooves for trapped fluid. 4,290,739, Cl. 418-189.000.
Koschmann, John E., to Owens-Illinois, Inc. Method for controlling a plastic extruder. 4,290,986, Cl. 264-40.300.
Koshiishi, Hiromichi; Mori, Kunio; Sato, Hiroshi; and Sakaida, Akira, to Nippon Steel Corporation. Process for box annealing a steel strip coil. 4,290,829, Cl. 148-130.000.
Kowa Company Limited: *See*—
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.
Kraatz, Udo: *See*—
Jager, Gerhard; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,291,044, Cl. 424-269.000.
Krambeck, Robert H.: *See*—
Cooper, James A., Jr.; and Krambeck, Robert H., 4,291,247, Cl. 307-481.000.
Kramer, Justin. Electronic wave sharing synthetic sound system. 4,290,334, Cl. 84-1.260.
Kramer, Louis T., to McDonnell Douglas Corp. Pin centered brake. 4,290,505, Cl. 188-18.00A.
Kramer, Wolfgang: *See*—
Kranz, Eckart; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,291,047, Cl. 424-273.00R.
Kranz, Eckart; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Combating fungi with α-azolyl-β-hydroxy-ketones. 4,291,047, Cl. 424-273.00R.
Krapcho, John, to E. R. Squibb & Sons, Inc. Mercaptoacyl derivatives of 4-disubstituted prolines and 4-substituted dehydroprolines. 4,291,040, Cl. 424-263.000.
Kraska, Allen R., to Pfizer Inc. Compounds derived from formylphenoxyacetic acid as antiviral agents in animals. 4,291,060, Cl. 424-316.000.
Krasnov, Valery A.; Klovsky, Yakov A.; Dubov, Igor V.; Shtern, Arkady V.; Vyatkin, Viktor L.; and Shavelzon, Lev A. Method of manufacturing a contact clip. 4,290,665, Cl. 339-276.00T.
Krauss, Ralf, to Steinrucke, Walter. Solar collector and process for its operation. 4,290,412, Cl. 126-419.000.
Krikoryan, Dikran A.: *See*—
Vlahov, Radoslav Y.; Krikoryan, Dikran A.; Zagorova, Maria S.; Ninova, Maya H.; and Parushev, Stoyan P., 4,290,862, Cl. 204-59.00R.
Kristiansen, Odd; and Drabek, Jozef, to Ciba-Geigy Corporation. 1-N,N-dimethylcarbamoyl-3(5)-alkyl-5(3)-alkylthioalkylthio-1,2,4-triazoles, a process for their manufacture, compositions which contain them and their use in pest control. 4,291,043, Cl. 424-269.000.
Kronman, Albert F.: *See*—
Peters, Melville F.; and Peters, Walter T., 4,290,417, Cl. 126-434.000.
Kroschel, Heinz: *See*—
Fischer, Klaus H.; Kroschel, Heinz; and Kolf, Heinrich, 4,290,637, Cl. 294-83.00A.
Krueger, Wallace F.: *See*—
Goodman, Ronald D.; Krueger, Wallace F.; and Shaw, Anthony R., 4,290,413, Cl. 126-426.000.
Kruger, Bradford E., to International Telephone and Telegraph Corporation. Adaptive two-dimensional null forming receiving antenna system. 4,291,310, Cl. 343-16.00R.
Kryczun, Alfred; and Manshausen, Theodor, to Klockner-Humboldt-Deutz AG. Method and installation for the cooling of reduced material such as fine grained ore. 4,290,801, Cl. 75-21.000.
Kubik, Donald A.: *See*—
Boerwinkle, Fred P.; and Kubik, Donald A., 4,290,912, Cl. 252-389.00R.
Kubik, Peter S.: *See*—
Anderson, Robert V.; Bayer, Douglas L.; Hagelbarger, David W.; and Kubik, Peter S., 4,291,198, Cl. 179-2.0DP.
Kubodera, Noboru: *See*—
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.
Kubota Ltd.: *See*—
Sakano, Kenji; Yamashita, Masahiro; Yamashita, Kenji; and Aketa, Masahiro, 4,290,395, Cl. 123-192.00B.
Sato, Shitomi, 4,290,372, Cl. 110-173.00R.
Kuhnel, Werner: *See*—
Neeff, Rutger; Kuth, Robert; Kuhnel, Werner; and Gohrbandt, Wilhelm, 4,290,768, Cl. 8-532.000.
Kuipers, Johannes: *See*—
Dolman, Hendrik; and Kuipers, Johannes, 4,291,161, Cl. 544-193.000.

Kume, Toyohiko: *See—*
Kishino, Shigeo; Saito, Junichi; Kume, Toyohiko; and Isono, Kunihiro, 4,290,978, Cl. 260-973.000.

Kunieda, Hisashi: *See—*
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.

Kuntz, Francis A., Jr., to Amtel, Inc. Mooring buoy. 4,290,158, Cl. 9-8.00P.

Kuo, Chang-Kiang, to Texas Instruments Incorporated. Method of making post-metal programmable MOS read only memory. 4,290,184, Cl. 29-571.000.

Kurafuji, Toshio: *See—*
Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; and Kurafuji, Toshio, 4,290,922, Cl. 252-456.000.

Kurchacova, Elva: *See—*
Van Dyke, John W., Jr.; and Kurchacova, Elva, 4,291,039, Cl. 424-256.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Sasaki, Tohru; Terasaki, Syuuzi; and Susa, Tomoo, 4,290,983, Cl. 264-22.000.

Kurt Vogelsang GmbH: *See—*
Wandl, Rudolf H., 4,290,706, Cl. 401-4.000.

Kusenda, Stephen R., to Insulation Materials, Inc. Method and apparatus for insulating buildings. 4,290,250, Cl. 52-404.000.

Kushi, Kenji: *See—*
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, 4,291,097, Cl. 428-412.000.

Kushnir, Alexandr P.: *See—*
Lizogub, Vadim A.; Kushnir, Alexandr P.; Figatner, Alexandr M.; and Bondar, Stepan E., 4,290,610, Cl. 277-13.000.

Kuth, Robert: *See—*
Neeff, Rutger; Kuth, Robert; Kuhnel, Werner; and Gohrbandt, Wilhelm, 4,290,768, Cl. 8-532.000.

Kutubuddin, Mohamed: *See—*
Bayer, Ernst; and Kutubuddin, Mohamed, 4,290,918, Cl. 252-431.00R.

Kuvas, Reidar L.: *See—*
Wen, Cheng P.; Kuvas, Reidar L.; and Immorlica, Anthony A., Jr., 4,291,320, Cl. 357-13.000.

Kuwata, Takeo; Shimada, Shoji; and Usa, Mikio, to Nittetsu Bolten Kabushiki Kaisha. Fastener set. 4,290,337, Cl. 411-2.000.

Kwak, Dochan. Aeration device. 4,290,885, Cl. 210-197.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Hirata, Tadashi; Ogasa, Takehiro; Saito, Hiromitsu; and Nakmizo, Nobuhiro, 4,291,164, Cl. 546-183.000.

L. D. Schreiber Cheese Co., Inc.: *See—*
Retzlaff, Wilfred F., 4,291,064, Cl. 426-397.000.

L. W. Fleckenstein, Inc.: *See—*
Fleckenstein, Andrew; and Mortl, Michael, 4,290,451, Cl. 137-624.150.

Labrecque, Clovis. Hub cap lock device. 4,290,283, Cl. 70-167.000.

Laclede Professional Products, Inc.: *See—*
Pellico, Michael A., 4,291,025, Cl. 424-180.000.

Lagana, Vincenzo: *See—*
Pagani, Giorgio; Lagana, Vincenzo; and Saviano, Francesco, 4,291,006, Cl. 423-359.000.

Lagowski, Joseph V., to Fairchild Incorporated. Coal mining machine cutter with noise suppressant and flame resistant layer. 4,290,653, Cl. 299-87.000.

Lahman, Fritz, to Lahman Manufacturing Company, Inc. Forage stack mover. 4,290,733, Cl. 414-476.000.

Lahman Manufacturing Company, Inc.: *See—*
Lahman, Fritz, 4,290,733, Cl. 414-476.000.

Laitinen, Heikki: *See—*
Sutela, Leo; and Laitinen, Heikki, 4,290,726, Cl. 414-421.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,290,762, Cl. 474-210.000.

Laloe, Franck: *See—*
Pinard, Michel; Aminoff, Carl; Trenec, Gerard; and Laloe, Franck, 4,291,281, Cl. 331-94.50C.

Lambert, Ralph E.: *See—*
Harman, Douglas G.; Lambert, Ralph E.; and Gruber, George W., 4,290,303, Cl. 73-105.000.

Laminoirs de Strasbourg: *See—*
Schoeps, Bernard; and Foret, Michel, 4,291,074, Cl. 427-367.000.

Lamy, Jacques E., to Compagnie Generale pour les Developpements Operationnels des Richesses sous Marines "C. G. Doris". Platform resting on the bottom of a body of water, and method of manufacturing the same. 4,290,716, Cl. 405-203.000.

Landstingens Inkopscentral, Ekonomisk Forening: *See—*
Wahl, Karl I.; and Lindstrom, Lars G., 4,290,424, Cl. 128-91.00A.

Lapeyre, James M., to Laitram Corporation, The. Multiple link transmission chain. 4,290,762, Cl. 474-210.000.

Larson, Gordon C., to Babcock & Wilcox Company, The. Support plug. 4,290,543, Cl. 228-2.500.

Laufer, Peter: *See—*
Stocklin, Gerhard; Laufer, Peter; and Machulla, Jurgen, 4,290,965, Cl. 260-408.000.

Lauffer, Donald E., to Phillips Petroleum Company. Method for determining pore size distribution and fluid distribution in porous media. 4,291,271, Cl. 324-307.000.

Lautenschlager, Horst, to Mepla Inc. Hinge for furniture pieces with a frame extending into the door opening. 4,290,167, Cl. 16-129.000.

Lawrence, Hopeton S., to Western Electric Co., Inc. Methods and apparatus for measuring the temperature of a continuously moving strand of material. 4,290,182, Cl. 29-527.400.

Lawrence, James E., Jr.: *See—*
McPherson, Alex L.; Triestram, Douglas E.; and Lawrence, James E., Jr., 4,290,836, Cl. 156-171.000.

Lawson, John E., to Armco Inc. Latch means for well tools and components. 4,290,483, Cl. 166-237.000.

Lazarus, Fred, III. Device for holding cooking pots and lids. 4,290,531, Cl. 211-71.000.

Leach, Bruce E., to Conoco, Inc. Catalyst composition useful for preparing 2,6-xylenol. 4,290,924, Cl. 252-469.000.

Leach, Fred: *See—*
Brown, Stuart R.; Feest, Eric A.; and Leach, Fred, 4,291,070, Cl. 427-213.000.

Leavell, Charles. Vibrationless pneumatic tools. 4,290,489, Cl. 173-17.000.

Lebkuecher, Rolf: *See—*
Ross, Karl-Heinz; Dudeck, Christian; Himmele, Walter; Lebkuecher, Rolf; and Sauer, Wolfgang, 4,290,960, Cl. 260-348.570.

Leco Corporation: *See—*
Bredeweg, Roger L.; and Sitek, George J., 4,290,296, Cl. 73-1.00G.

Leduc, Lucien. Ramp to load and unload vehicles into and from a truck body. 4,290,728, Cl. 414-537.000.

Lee, Lieng-Huang, to Xerox Corporation. Siloxane hole trapping layer for overcoated photoreceptors. 4,291,110, Cl. 430-59.000.

Lee, Peter D., to Governor & Company of the Bank of England. Security devices. 4,290,630, Cl. 283-8.00R.

Leevers, David F. A.: *See—*
White, Roy L.; Leevers, David F. A.; and Kitchin, Peter W., 4,290,538, Cl. 222-25.000.

Legrand, Marie G. J. Machine for the cutting of rocks in underground works. 4,290,652, Cl. 299-45.000.

Leigh, Steven; and Ayres, Peter J., to Phares Pharmaceutical Research N.V. Pharmaceutical compositions containing urea. 4,291,062, Cl. 424-322.000.

Leininger, James C.: *See—*
Wishman, Marvin; Taylor, Peter A.; and Leininger, James C., 4,291,093, Cl. 428-379.000.

Lenkner, William A.: *See—*
Collins, Edward J.; and Lenkner, William A., 4,290,748, Cl. 431-359.000.

Leonard, David P.: *See—*
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,290,932, Cl. 260-29.6WB.

Leonard, John J., to Atlantic Richfield Company. Preparation of polyisocyanates from polycarbamates. 4,290,968, Cl. 260-453.00P.

Leonard, Robert E., to Kerr-McGee Refining Corporation. Supercritical process for producing deasphalted demetallized and deresined oils. 4,290,880, Cl. 208-309.000.

Lessmann, Gerald G.; Simpson, Ronald P.; Reichenecker, William J.; and O'Brokta, Ronald D., to Westinghouse Electric Corp. Method of welding utilizing both consumable and non-consumable electrodes. 4,291,220, Cl. 219-137.00R.

Levine, Stephen A.; and White, William R., to Texaco Inc. Oxymolybdenum dialkyldithiophosphates and lubricants containing same. 4,290,902, Cl. 252-32.70E.

Lewis, Daniel M.: *See—*
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,290,865, Cl. 204-106.000.

LGZ Landis & Gyr Zug AG.: *See—*
Schneider, Gernot; and Steinle, Benedikt, 4,291,377, Cl. 364-483.000.

Li, George S.: *See—*
Kiikka, Oliver A.; and Li, George S., 4,291,181, Cl. 585-320.000.

Liao, John C.; Patel, Chittaranjan P.; and Ponzo, John L., to Miles Laboratories, Inc. Stabilized Romanowsky stain solution. 4,290,769, Cl. 8-602.000.

Libbey-Owens-Ford Company: *See—*
Goodman, Ronald D.; Krueger, Wallace F.; and Shaw, Anthony R., 4,290,413, Cl. 126-426.000.

Liberty Glass Company: *See—*
Brockway, M. Clifford, 4,290,793, Cl. 65-30.140.

Licentia Patent-Verwaltungs G.m.b.H.: *See—*
Dahlberg, Reinhard, 4,291,191, Cl. 136-246.000.

Lichti, Robert D.; and Hock, Frederick D., to Park Mobile, Inc., by said Frederick D. Hock. Conveyor pan immobilizing assembly. 4,290,724, Cl. 414-251.000.

Liebert, Karl-Heinz; and Tischer, Werner, to Zahnradfabrik Friedrichshafen, AG. Steering valve with spring torsion rod. 4,290,738, Cl. 418-61.00B.

Lien, Jih-Chang; and Chiu, Te-Long, to Texas Instruments Incorporated. Interlevel insulator for integrated circuit with implanted resistor element in second-level polycrystalline silicon. 4,291,328, Cl. 357-59.000.

Lienhard, Paul: *See—*
Reinehr, Dieter; and Lienhard, Paul, 4,290,964, Cl. 260-404.000.

Life Savers, Inc.: *See—*
Mackay, Donald A. M.; Witzel, Frank; and Linke, Harald A. B., 4,291,045, Cl. 424-270.000.

Ligas, Kenneth M.: *See—*
Ostenberg, John R.; and Ligas, Kenneth M., 4,290,223, Cl. 43-54.50R.

Lillibridge, Harold R.: *See*—
Sullivan, John; and Lillibridge, Harold R., 4,290,547, Cl. 229-77.000.

Lindblad, Karl-Erick. Maneuvering device for sailing boats. 4,290,760, Cl. 440-51.000.

Lindenschmidt, Gerhard: *See*—
Hambrecht, Jurgen; Lindenschmidt, Gerhard; and Regel, Walter, 4,291,134, Cl. 525-92.000.

Lindstrom, Lars G.: *See*—
Wahl, Karl I.; and Lindstrom, Lars G., 4,290,424, Cl. 128-91.00A.

Linhart, Helmut: *See*—
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, 4,290,941, Cl. 260-45.85B.

Linke, Harald A. B.: *See*—
Mackay, Donald A. M.; Witzel, Frank; and Linke, Harald A. B., 4,291,045, Cl. 424-270.000.

Linnik, Ivan I.: *See*—
Lukhvich, Alexandr A.; Rudnitsky, Valery A.; Linnik, Ivan I.; and Gavris, Genrikh B., 4,291,270, Cl. 324-230.000.

Lipovsky, Iosif L.: *See*—
Fedotov, Vladimir M.; Smirnov, Boris A.; Lukomsky, Genrikh I.; and Lipovsky, Iosif L., 4,290,542, Cl. 227-155.000.

Littelfuse, Inc.: *See*—
Tait, Robert J., 4,290,183, Cl. 29-564.800.

Litton Systems, Inc.: *See*—
Goldfarb, Samuel; and Reilly, Thomas, 4,290,705, Cl. 400-618.000.

Lizogub, Vadim A.; Kushnir, Alexandr P.; Figatner, Alexandr M.; and Bondar, Stepan E. Labyrinth seal. 4,290,610, Cl. 277-13.000.

Loane, Charles M., Jr., to Mobay Chemical Corporation. Raw mix flux for continuous casting of steel. 4,290,809, Cl. 75-257.000.

Locatell, Louis, Jr.: *See*—
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,290,951, Cl. 260-326.12R.

Locke, Kay M.: *See*—
Clemens, James T.; and Locke, Kay M., 4,291,322, Cl. 357-23.000.

Lockheed Corporation: *See*—
Steiner, William G., 4,291,404, Cl. 371-20.000.

Logan, William F., 3rd. Folding chair. 4,290,643, Cl. 297-16.000.

Lombard, Marco H., to Emerson Electric Co. Apparatus for cutting vegetation. 4,290,200, Cl. 30-276.000.

Lombardi, Michael. Claw hammer with improved fulcrum. 4,290,583, Cl. 254-26.00R.

Loock, Ehrenfried, to Olympia Werke AG. Process for the production of inks free of foreign salts. 4,290,812, Cl. 106-22.000.

Lord Corporation: *See*—
Rebman, Jack, 4,290,203, Cl. 33-169.00C.

L'Oreal: *See*—
Bouillon, Claude; and Vayssie, Charles, 4,290,974, Cl. 260-511.000.
Sebag, Henri; and Vanlerberghe, Guy, 4,290,956, Cl. 260-338.000.

Lorenz, Hans J.: *See*—
Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, 4,290,941, Cl. 260-45.85B.

Lorusso, Simone: *See*—
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.

Losert, Wolfgang: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Prezewowsky, Klaus; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,291,029, Cl. 424-238.000.

Lowenstein, Felice: *See*—
Wasserman, Allan, 4,290,260, Cl. 57-210.000.

Lowery, Robert L. Boot tool. 4,290,539, Cl. 223-118.000.

Lowery, Vernon: *See*—
Browning, James S.; Pfeiler, Peter F.; and Lowery, Vernon, 4,290,207, Cl. 33-295.000.

Lowther, Frank E., to Purification Sciences, Inc. Vehicle braking and kinetic energy recovery system. 4,290,268, Cl. 60-668.000.

Lu, Chin H., to Xerox Corporation. Nitrogen-containing additives for magnetic toners having hydrophobic and hydrophilic moiety. 4,291,111, Cl. 430-107.000.

Lu, Chin H., to Xerox Corporation. Modification of pigment charge characteristics. 4,291,112, Cl. 430-110.000.

Lucas Industries Limited: *See*—
Baum, Heinz W., 4,290,508, Cl. 188-73.380.
Edmonds, Richard D., 4,291,206, Cl. 200-19.00R.

Lucas, William G.: *See*—
Ports, Kenneth A.; and Lucas, William G., 4,290,831, Cl. 148-187.000.

Lucero, Rohn Lee. Training aid. 4,290,758, Cl. 434-227.000.

Ludec, Joel L., to Rhone-Poulenc Industries. Preparation of orthohydroxybenzyl alcohols. 4,291,178, Cl. 568-764.000.

Ludemann, Heinz; and Ziegler, Franz, to Agfa-Gevaert AG. Apparatus for stacking sections of developed photographic films or the like. 4,290,594, Cl. 271-180.000.

Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., to Southwest Research Institute. Sulfur compounds and method of making same. 4,290,816, Cl. 106-287.320.

Luhrsen, Ernst; and Schermer, Heinz, to Didier-Werke AG. Teeming pipe for use at the outlet of a melt container. 4,290,589, Cl. 266-236.000.

Luke, Michael A.: *See*—
Beall, Clifford H.; Amancharla, Amareswar; and Luke, Michael A., 4,290,484, Cl. 166-242.000.

Lukhvich, Alexandr A.; Rudnitsky, Valery A.; Linnik, Ivan I.; and Gavris, Genrikh B. Apparatus with a permanent magnet for gauging the thickness of coatings on metal products with magnetic shunt to adjust for demagnetization of the permanent magnet. 4,291,270, Cl. 324-230.000.

Lukomsky, Genrikh I.: *See*—
Fedotov, Vladimir M.; Smirnov, Boris A.; Lukomsky, Genrikh I.; and Lipovsky, Iosif L., 4,290,542, Cl. 227-155.000.

Luomaranta, Mauri, to Scandinavian Ski Shop Limited. Apparatus for testing and fitting cross-country skis. 4,290,499, Cl. 177-48.000.

Lupton, Harold W.; and Reed, David E., to Iowa State University Research Foundation, Inc. Vaccine for infectious bovine rhinotracheitis. 4,291,019, Cl. 424-89.000.

Luschen, Joseph G.; and Theeuwes, Felix, to ALZA Corporation. Dispenser for dispensing beneficial agent. 4,290,426, Cl. 128-260.000.

Luteri, George F., to Velsicol Chemical Corporation. Sucrose ester of 2-methoxy-3,6-dichlorobenzoic acid. 4,291,158, Cl. 536-115.000.

Lutich, Louis L.: *See*—
Earp, Sherald B.; Lutich, Louis L.; and Harris, Jesse W., 4,290,578, Cl. 251-63.000.

Lyons, Harold D., to Milliken Research Corporation. Breathable leather-like materials and process for making same. 4,291,078, Cl. 428-91.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Kobler, Ingo; Mamberer, Hans; and Zwosta, Helge, 4,290,362, Cl. 101-350.000.
Kobler, Ingo, 4,290,363, Cl. 101-351.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft Offenbach: *See*—
Fischer, Hermann, 4,290,360, Cl. 101-148.000.

M. B. Sturgis, Inc.: *See*—
Sturgis, Malcolm B., 4,290,440, Cl. 137-75.000.

MacBean, Donald G.: *See*—
Buchanan, John G.; and MacBean, Donald G., 4,290,209, Cl. 34-123.000.

MacCarthy, Patrick, to Bisque, Ramon E.; and Stermole, Franklin J., a part interest to each. Tape-supported yo-yo. 4,290,224, Cl. 46-61.000.

MacCarthy, Patrick. Looped-string pulley-supported yo-yo. 4,290,225, Cl. 46-61.000.

Macgilp, Neil A.; and Mann, Duncan A., to Procter & Gamble Company, The. Packaged free flowing bleach activator product. 4,290,903, Cl. 252-91.000.

Machida, Naoki, deceased: *See*—
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.

Machulla, Jurgen: *See*—
Stocklin, Gerhard; Laufer, Peter; and Machulla, Jurgen, 4,290,965, Cl. 260-408.000.

Mack, Michael H. Iron plumbing corrosion minimizing method. 4,290,868, Cl. 204-148.000.

Mackay, Donald A. M.; Witzel, Frank; and Linke, Harald A. B., to Life Savers, Inc. Method of reducing dental caries. 4,291,045, Cl. 424-270.000.

MacMillan, Deane B.; and Donigan, Carolyn L. Feed through capacitors and method of installing. 4,291,362, Cl. 361-302.000.

Maehara, Toshifumi; and Kawase, Kazuo, to Akebono Brake Industry Co. Ltd. Master cylinder device. 4,290,265, Cl. 60-561.000.

Magers, Thomas A.; and Tabb, David L., to Miles Laboratories, Inc. Stabilization of benzidine-type indicators with various enhancers. 4,290,773, Cl. 23-230.00B.

Magolda, Ronald L.: *See*—
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., 4,291,166, Cl. 549-51.000.

Magyar Vagon- es Gepgyar: *See*—
Horvath, Tibor, 4,290,622, Cl. 280-400.000.

Mahoney, Dennis M.: *See*—
Beach, William F.; and Mahoney, Dennis M., 4,291,244, Cl. 307-400.000.

Main-Tainer Corporation: *See*—
Kleinwolterink, Henry, 4,290,423, Cl. 128-80.00G.

Maitani, Yoshihisa; and Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Programmed shutter device. 4,290,681, Cl. 354-230.000.

Majkrzak, David S.; and Hinkel, Dwight B., to Steiger Tractor, Inc. Wheel rim mounting device for variable wheel spacing. 4,290,654, Cl. 301-9.0TV.

Majkrzak, Edward A.: *See*—
Benjamin, Milton L.; Miles, Wilbur N.; and Majkrzak, Edward A., 4,290,206, Cl. 33-185.00R.

Maki-Hoimela, Veijo: *See*—
Rysti, Alpo; Anttila, Seppo; and Maki-Hoimela, Veijo, 4,290,722, Cl. 414-48.000.

Malone, Thomas R.; Foster, Talmage D., Jr., deceased; and Foster, Sue T., executrix, to Union Carbide Corporation. Thermal stabilizer for non-clay wellbore fluids. 4,290,899, Cl. 252-8.50A.

Malone, William H.; Fischley, John; Anderson, Harry L.; and Spirko, Edward J., to Republic Steel Corporation. Blast furnace stove. 4,290,751, Cl. 432-214.000.

Maloney, Timothy, to One Design, Inc. Phase change energy storage panel for environmentally driven heating and cooling system. 4,290,416, Cl. 126-430.000.

Mamberer, Hans: *See*—
Kobler, Ingo; Mamberer, Hans; and Zwosta, Helge, 4,290,362, Cl. 101-350.000.

Manchester, Luther L., Jr.; and Reneau, Bobby J. Apparatus for connecting together flowline end portions. 4,290,632, Cl. 285-323.000.

Manders, Petrus G. J., to Ruti-Te Strake B.V. Blowing nozzle for transporting a flexible thread. 4,290,459, Cl. 139-435.000.

Mandt, Mikkel G., to Clevepak Corporation. Nitrification-denitrification system. 4,290,884, Cl. 210-195.300.

Manetta, Alberto. Stress incontinence diagnostic and treatment device. 4,290,420, Cl. 128-1.00R.

Maniscalco, Joseph P.: *See—*
Allain, Ronald J.; and Maniscalco, Joseph P., 4,291,167, Cl. 556-430.000.

Maniwa, Takeshi: *See—*
Komatsu, Kazurou; Matsumoto, Sojiro; Maniwa, Takeshi; and Shinmura, Nobuyuki, 4,290,969, Cl. 260-453.0AB.

Mann, Duncan A.: *See—*
Macgilp, Neil A.; and Mann, Duncan A., 4,290,903, Cl. 252-91.000.

Mann, Gamdur S.; Tendulkar, Dilip V.; and Parker, William J., to General Motors Corporation. Diesel engine exhaust trap particulate distribution and incineration balancing system. 4,290,263, Cl. 60-311.000.

Manning, Lindley, to Superior Concrete Accessories, Inc. Apparatus for releasable connection to an embedded member. 4,290,638, Cl. 294-89.000.

Mannuzza, Frank J.: *See—*
Girgis, Makram M.; Jackson, David E.; and Mannuzza, Frank J., 4,290,774, Cl. 23-230.00B.

Manshausen, Theodor: *See—*
Kryczun, Alfred; and Manshausen, Theodor, 4,290,801, Cl. 75-21.000.

Manson, Lewis A. Gravity measuring apparatus. 4,290,307, Cl. 73-382.00R.

Maples, Billy G. Hand-held and operated seeder apparatus. 4,290,374, Cl. 111-92.000.

Marcus, Michael A., to Eastman Kodak Company. Piezoelectric flash-ready indicator for photographic camera. 4,290,678, Cl. 354-128.000.

Maringer, Robert E., to Battelle Development Corp. Method and apparatus for making nodule filament fibers. 4,290,993, Cl. 264-164.000.

Mark, Harold W.: *See—*
McKay, Dwight L.; Bertus, Brent J.; and Mark, Harold W., 4,290,919, Cl. 252-437.000.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Plasticized polycarbonate composition. 4,290,934, Cl. 260-30.80R.

Mark, Victor, to General Electric Co. Process for preparing polycarbonate using non-cyclic polyamine catalysts. 4,291,150, Cl. 528-199.000.

Mark, Victor, to General Electric Company. Process for preparing polycarbonate using cyclic di- or triamine catalyst. 4,291,151, Cl. 528-199.000.

Mark, Victor; and Wilson, Charles A., II, to General Electric Company. Process for obtaining halogenated diphenols. 4,291,177, Cl. 568-726.000.

Marsan, Mario. Holder for portable electric cutting instrument. 4,290,464, Cl. 144-136.00C.

Marshall, Albert H.; and Towle, Herbert C., to United States of America, Navy. Burst on target simulation device for training with rockets. 4,290,757, Cl. 434-12.000.

Marshall, George E., Jr.: *See—*
Schmidt, Lewis W.; Bettencourt, Darryl G.; Dietz, Charles F.; and Marshall, George E., Jr., 4,290,352, Cl. 100-100.000.

Marshall, Michael A.: *See—*
Swales, Danvers A.; and Marshall, Michael A., 4,291,000, Cl. 423-53.000.

Marston, Robert K.: *See—*
Caples, Edgar L.; Marston, Robert K.; and Massad, Khalil E., 4,291,410, Cl. 375-1.000.

Martenas, Wayne B., to Sperry Corporation. Feed roll apparatus. 4,290,255, Cl. 56-10.200.

Martin, Gordon E., to United States of America, Navy. Discrete amplitude shading for lobe-suppression in discrete array. 4,291,396, Cl. 367-154.000.

Martin, Lawrence L.; and Worm, Manfred, to Hoechst-Roussel Pharmaceuticals, Inc. Spiro[cyclohexane-1,1'(3'H)-isobenzofuran]s. 4,290,958, Cl. 260-346.730.

Martino, William L., Jr.; and Moench, Jerry D., to Motorola Inc. Differential capacitive buffer. 4,291,246, Cl. 307-475.000.

Maruhashi, Shigeaki; Hasegawa, Morihiro; and Yamauchi, Takashi, to Nisshin Steel Company, Ltd. Process for dephosphorization and denitrification of chromium-containing pig iron. 4,290,803, Cl. 75-52.000.

Marumoto, Katsuji; and Ohmae, Tsutomu, to Hitachi, Ltd. Control apparatus for controlling transistor chopper for use in current supply for electric motor. 4,291,259, Cl. 318-139.000.

Maruyoshi Sangyo Kabushiki Kaisha: *See—*
Yonaga, Yoshifumi, 4,291,197, Cl. 179-2.0EA.

Maryland Cup Corporation: *See—*
Shapiro, Henry, 4,290,573, Cl. 248-152.000.

Maschinenfabrik Augsburg-Nuremberg Aktiengesellchaft: *See—*
Urlaub, Alfred, 4,290,396, Cl. 123-193.0CH.

Mascia, Frank: *See—*
Wuthrich, Paul; and Mascia, Frank, 4,291,397, Cl. 368-35.000.

Mass, Ronald H., to Schlegel Corporation. Elastomeric spring expansion joint-seal strip. 4,290,249, Cl. 52-396.000.

Massachusetts Institute of Technology: *See—*
Smith, Joseph L., Jr.; and Kirtley, James L., Jr., 4,291,249, Cl. 310-214.000.
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,291,390, Cl. 365-183.000.

Massad, Khalil E.: *See—*
Caples, Edgar L.; Marston, Robert K.; and Massad, Khalil E., 4,291,410, Cl. 375-1.000.

Massana, Miguel P. Adjustable annular prosthesis for cardiac surgery. 4,290,151, Cl. 3-1.500.

Massy, Derek J. R., to Ciba-Geigy Corporation. Aminotriazinepolycarboxylic acids and partial esters thereof. 4,291,162, Cl. 544-199.000.

Masuda, Seiichi: *See—*
Hirata, Takeyuki; Hiroki, Nobuyoshi; and Masuda, Seiichi, 4,290,802, Cl. 75-52.000.

Masuda, Shigeyuki, to Kabushiki Kaisha Daini Seikosha. Calendar display wheel guard construction of timepiece. 4,291,398, Cl. 368-37.000.

Mathieu, Serge, to h.o.p. Consulab Inc. Apparatus for analyzing a physical quantity. 4,291,356, Cl. 361-87.000.

Matier, William L.: *See—*
Johnson, Porter C.; and Matier, William L., 4,291,168, Cl. 556-441.000.

Matsson, Karl J., to Stiftelsen Blekinge Produkter. Wooden shoe including hinge. 4,290,212, Cl. 36-33.000.

Matsudo, Kazuo; Adaniya, Takeshi; Ohmura, Masaru; Shoji, Masahiro; and Watanabe, Tsutomu, to Nippon Kokan Kabushiki Kaisha. Process for manufacturing electro-galvanized steel sheet excellent in paint adherence. 4,290,860, Cl. 204-27.000.

Matsufuji, Akihiro: *See—*
Kondoh, Syunichi; Matsufuji, Akihiro; and Umehara, Akira, 4,290,870, Cl. 204-159.150.

Matsui, Kunio; Tsuchiya, Hiroaki; Suzuki, Ryushi; and Omura, Takayoshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Gas-liquid separator. 4,290,791, Cl. 55-399.000.

Matsumoto, Sojiro: *See—*
Komatsu, Kazurou; Matsumoto, Sojiro; Maniwa, Takeshi; and Shinmura, Nobuyuki, 4,290,969, Cl. 260-453.0AB.

Matsumoto, Takao, to Tomy Kogyo Co., Inc. Game having pathway traversing a plurality of independent object transfer mechanisms. 4,290,605, Cl. 273-110.000.

Matsumura, Shunichi: *See—*
Inata, Hiroo; Matsumura, Shunichi; and Ogasawara, Makoto, 4,291,152, Cl. 528-289.000.

Matsuoka, Hideoki: *See—*
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,291,373, Cl. 364-443.000.

Matsushima, Noriaki: *See—*
Funabiki, Kyohei; Matsushima, Noriaki; and Inouye, Naomitsu, 4,290,928, Cl. 260-28.00P.

Matsushita Electric Industrial Co., Ltd.: *See—*
Takenaga, Mutsuo; and Yamamoto, Osamu, 4,290,909, Cl. 252-301.40R.
Taki, Yasuo; Araki, Shigeru; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,290,732, Cl. 414-752.000.

Matsushita Electronics Corporation: *See—*
Takamura, Tooru; Terakawa, Sumio; Nakatani, Hirokuni; and Murozono, Izumi, 4,291,337, Cl. 358-213.000.

Matthias, Dan W., to Exxon Research & Engineering Co. Flexible ribbon guide means. 4,290,704, Cl. 400-248.000.

Maturo, Robert J.: *See—*
Henderson, John G. N.; and Maturo, Robert J., 4,291,413, Cl. 455-164.000.

Maupre, Jean-Pierre; and Trouve, Jean, to Commissariat a l'Energie Atomique. Process for cleaning a cold trap. 4,290,822, Cl. 134-19.000.

Max-Plank-Gesellschaft: *See—*
Birr, Christian, 4,290,943, Cl. 260-112.50R.

Maxwell, James L.: *See—*
Zobel, Henry F.; and Maxwell, James L., 4,291,065, Cl. 426-549.000.

Maxwell, Thomas J. Nonpredictable game projectile. 4,290,606, Cl. 273-128.00R.

Mayama, Koichi; Yamaguchi, Noboru; Sugie, Mamoru; Kita, Yuzo; and Yoshizawa, Shigeru, to Hitachi, Ltd. Timing signal generating circuit. 4,291,241, Cl. 307-269.000.

Mayer, James R., to Cooper Industries, Inc. Rock drill positioning mechanism. 4,290,491, Cl. 173-43.000.

Mayer, Russel. End control, electrical, power drive unit for agricultural sprinkler irrigation systems. 4,290,559, Cl. 239-716.000.

Mayo, Carlos, to C. Mayo, Inc. Fireplace glass door with heat circulator. 4,290,409, Cl. 126-121.000.

Mazzini, Giulio, to WABCO Westinghouse. Manual and motor actuated railway car door. 4,290,368, Cl. 105-341.000.

McCaffrey, Craig R.; and Barraclough, Gary O., to Betz Laboratories, Inc. Process for removing sulfur dioxide from flue gas. 4,291,004, Cl. 423-242.000.

McCahill, David I., to Three Rivers Enterprises, Inc. Digital energy monitor. 4,291,376, Cl. 364-483.000.

McClaren, Sherwood W., III: *See—*
Ely, Richard A.; and McClaren, Sherwood W., III, 4,291,080, Cl. 428-116.000.

McConkey, Robert C.: *See—*
Noonan, John M.; and McConkey, Robert C., 4,291,153, Cl. 528-290.000.

McConnell, Edmund A.; Yearsley, Norman; and Blockley, Alec G., to Wickman Machine Tool Sales Limited. Clutch protection device. 4,290,514, Cl. 192-30.00W.

McConnell, Lloyd A., to Irrigation and Power Equipment, Inc. Parallel angularity sensor for center pivot irrigation system. 4,290,556, Cl. 239-177.000.

McCoy, Dale E.: *See—*
Chase, Kenneth P.; and McCoy, Dale E., 4,291,095, Cl. 428-391.000.

McCreight, Donald O.: *See—*
Pavlica, Stanley R.; and McCreight, Donald O., 4,290,814, Cl. 501-107.000.
McDonald, Gerald F. Travel game device. 4,290,607, Cl. 273-239.000.
McDonnell Douglas Corp.: *See—*
Kramer, Louis T., 4,290,505, Cl. 188-18.00A.
McGovern, Terrence P.; and Schreck, Carl E., to United States of America, Agriculture. Alicyclic piperidine derivatives as insect repellents. 4,291,041, Cl. 424-267.000.
McGregor, Charles W.; Karkoski, Joseph; and Shurboff, John D., to Essex Group, Inc. Aqueous solutions of polyesterimides and methods of making the same. 4,290,929, Cl. 260-29.20N.
McIntire, John M.; and Blair, Richard H., to Permabond International Corp. Plastic nozzles of moldable polyethylene and polypropylene polymers having organic acids dispersed therein. 4,291,131, Cl. 525-5.000.
McIntyre, Charles A. Cowling port closure and method. 4,290,569, Cl. 244-129.400.
McKay, Dwight L.; Bertus, Brent J.; and Mark, Harold W., to Phillips Petroleum Co. Cracking catalysts passivated by tungsten. 4,290,919, Cl. 252-437.000.
McKenny, Vernon G.; and Chan, Tsiu C., to Mostek Corporation. Method of making an extremely low current load device for integrated circuit. 4,290,185, Cl. 29-571.000.
McKenzie, Kenneth B., to Port-A-Lock Incorporated. Door locking device. 4,290,635, Cl. 292-290.000.
McLandrich, Matthew N., to United States of America, Navy. Method to eliminate fiber interferometer reflections. 4,290,697, Cl. 356-350.000.
McLennan, Charles I.; Stokes, Marshall G.; and Konucik, George J., to Konucik, George Joseph. Sportsman's retriever. 4,290,159, Cl. 9-9.000.
McLeod, William D., to Fishing Innovations, Inc. Fishing apparatus. 4,290,222, Cl. 43-15.000.
McMonigle, Matthew J.; and Klingensmith, Chester H., to Aluminum Company of America. Gasket for sealing joints in carbonaceous elements in electrolysis cell. 4,290,874, Cl. 204-243.00R.
McPherson, Alex L.; Triestram, Douglas E.; and Lawrence, James E., Jr., to Clow Corporation. Method of making composite pipe having an integral bell end. 4,290,836, Cl. 156-171.000.
McRitchie, Allan C.: *See—*
Harris, Richard G.; McRitchie, Allan C.; and Wilson, Alexander D., 4,291,071, Cl. 427-220.000.
Mead Corporation, The: *See—*
Donahue, John W., 4,291,340, Cl. 358-296.000.
Mead Johnson & Company: *See—*
Johnson, Porter C.; and Matier, William L., 4,291,168, Cl. 556-441.000.
Mechanical Service Company: *See—*
Hudimac, George S., Jr., 4,290,700, Cl. 366-76.000.
Mechanical Technology Incorporated: *See—*
Clark, Howard L.; Dorman, Richard A.; and Back, Paul, 4,291,258, Cl. 318-124.000.
Mechanical Transplanter Company: *See—*
Boots, W. Stewart; and Altman, Jay C., 4,290,373, Cl. 111-3.000.
Mecklenborg, Richard A.: *See—*
Belva, George M.; and Mecklenborg, Richard A., 4,290,669, Cl. 350-174.000.
Meckler, Milton. Peltier effect absorption chiller-heat pump system. 4,290,273, Cl. 62-148.000.
Medici, Italo: *See—*
Farcilli, Andre; Medici, Italo; Fournex, Robert; and Barzaghi, Fernando, 4,291,038, Cl. 424-256.000.
Medovar, Boris I.; Boiko, Georgy A.; Dubinsky, Rudolf S.; and Egorov, Sergei P. Method and apparatus for electroslag casting of metals. 4,290,474, Cl. 164-470.000.
Meeh, Wilhelm, to Motoren-und-Turbinen-Union Friedrichshafen GmbH. Marine propulsion unit. 4,290,270, Cl. 60-716.000.
Meiji Seika Kaisha, Ltd.: *See—*
Yoneta, Toshio; Shibahara, Seiji; Seki, Shigeo; and Fukatsu, Shunzo, 4,290,972, Cl. 260-465.00B.
Mein, Peter G.; and Reidies, Arno H., to Carus Corporation. Rare-earth-manganese oxidation catalysts and process of producing same. 4,290,923, Cl. 252-462.000.
Meixsel, Lawrence D.: *See—*
Goetz, Richard W.; Meixsel, Lawrence D.; and Smith, David W., 4,291,179, Cl. 568-882.000.
Melara, Francescantonio. Self-aligning twin-wheeled caster. 4,290,166, Cl. 16-47.000.
Mellin, Gerald D., to Seaman Corporation. Building membrane hold-down system. 4,290,243, Cl. 52-63.000.
Mentelos, Richard A.: *See—*
Herbert, Normand C.; Burwen, Richard S.; and Mentelos, Richard A., 4,290,431, Cl. 128-635.000.
Mepla Inc.: *See—*
Lautenschlager, Horst, 4,290,167, Cl. 16-129.000.
Merchant, Donald K., to North American Philips Controls Corp. Circuit breaker provided with collapsible telescoping linkage. 4,291,291, Cl. 335-191.000.
Merck & Co., Inc.: *See—*
Brown, Jeannette E.; Rogers, Edward F.; and Graham, Donald W., 4,290,966, Cl. 260-413.000.
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzman, Thomas N., 4,290,947, Cl. 260-239.00A.
Kang, Kenneth S.; and Veeder, George T., 4,291,156, Cl. 536-1.000.
Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., 4,291,050, Cl. 424-278.000.
Merck Patent Gesellschaft Mit Beschrankter Haftung: *See—*
Wahlig, Helmut; Dingeldein, Elvira; and Braun, Dietrich, 4,291,013, Cl. 424-16.000.
Merger, Franz; and Towae, Friedrich, to BASF Aktiengesellschaft. Process for the manufacture of aromatic di- and/or polyisocyanates. 4,290,970, Cl. 260-453.00P.
Merisinter S.p.A.: *See—*
Apuzzo, Gennaro; and Bocchini, Gian F., 4,290,655, Cl. 308-121.000.
Mertz, Harold J., Jr.: *See—*
Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., 4,290,627, Cl. 280-729.000.
Mese, Michihiro; Kashioka, Seiji; Ejiri, Masakazu; Miyatake, Takafumi; Yamazaki, Isamu; and Hamada, Toshimitsu, to Hitachi, Ltd. System for detecting the position of an object. 4,291,334, Cl. 358-101.000.
Messer Griesheim: *See—*
Braun, Werner, 4,291,217, Cl. 219-121.0PH.
Messerschmitt-Bolkow-Blohm G.m.b.H.: *See—*
Weidenhagen, Dieter; and Schnaebele, Werner, 4,290,364, Cl. 102-384.000.
Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, to Montedison S.p.A. Process for catalytically reducing carbonyl compounds. 4,290,961, Cl. 260-397.400.
Meszaros, Zoltan: *See—*
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.
Metallurgie Hoboken-Overpelt: *See—*
Dompas, John, 4,290,823, Cl. 148-2.000.
Metzeler Schaum GmbH: *See—*
Bruckner, Georg F.; Geike, Bernd; Berger, Fritz; and Schoen, Bernd-Jurgen, 4,290,147, Cl. 2-18.000.
Meyer, Willy; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; and Karrer, Friedrich, to Ciba-Geigy Corporation. Pesticidal esters. 4,291,056, Cl. 424-304.000.
Michishita, Kazuhiko: *See—*
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, 4,290,962, Cl. 260-397.450.
Mick, Martin B.: *See—*
Woodall, Robert M.; Damron, Eugene; and Mick, Martin B., 4,290,879, Cl. 208-232.000.
Microwave Associates, Inc.: *See—*
Buntschuh, Charles D., 4,291,415, Cl. 455-328.000.
Middel, Jan, to Hoogovens Ijmuiden, B.V. Method and apparatus for folding a cardboard sheet along a straight fold line. 4,290,764, Cl. 493-395.000.
Midland-Ross Corporation: *See—*
Isakson, Larry E., 4,290,342, Cl. 91-391.00R.
Milana, Emilio, to Centro Ricerche Fiat S.p.A. Apparatus for testing surface roughness. 4,290,698, Cl. 356-371.000.
Miles Laboratories, Inc.: *See—*
Acquati, Giancarlo; Berti, Giovanni; and Fossati, Piero, 4,291,121, Cl. 435-10.000.
Girgis, Makram M.; Jackson, David E.; and Mannuzza, Frank J., 4,290,774, Cl. 23-230.00B.
Liao, John C.; Patel, Chittaranjan P.; and Ponzo, John L., 4,290,769, Cl. 8-602.000.
Magers, Thomas A.; and Tabb, David L., 4,290,773, Cl. 23-230.00B.
Van Dyke, John W., Jr.; and Kurchacova, Elva, 4,291,039, Cl. 424-256.000.
Miles, Wilbur N.: *See—*
Benjamin, Milton L.; Miles, Wilbur N.; and Majkrzak, Edward A., 4,290,206, Cl. 33-185.00R.
Miller, Brian S.: *See—*
Jones, Terry L.; and Miller, Brian S., 4,291,068, Cl. 427-88.000.
Miller, Franklyn D.: *See—*
Muller, Werner C.; and Miller, Franklyn D., 4,291,124, Cl. 435-162.000.
Miller, James A.: *See—*
Felland, Richard A.; and Miller, James A., 4,291,213, Cl. 200-335.000.
Miller, Robert L.: *See—*
Burton, James M.; Miller, Robert L.; and Tieden, Jansey D., 4,291,384, Cl. 364-560.000.
Miller, Theodore E., Jr.: *See—*
Stevens, Timothy S.; and Miller, Theodore E., Jr., 4,290,775, Cl. 23-230.00R.
Milliken Research Corporation: *See—*
Burns, Alonzo M., Jr.; Silliman, Jeffrey E.; Gilbert, Woodrow P.; and Pascoe, William M., Sr., 4,290,766, Cl. 8-491.000.
Lyons, Harold D., 4,291,078, Cl. 428-91.000.
Milum, Jimmy L.: *See—*
Pittman, Robert R.; Elbrader, Clifford B.; and Milum, Jimmy L., 4,290,788, Cl. 55-138.000.
Minagawa, Kenichiro: *See—*
Tanizaki, Yoshiharu; Minagawa, Kenichiro; Akimoto, Shinichi; and Horioka, Kuninori, 4,291,101, Cl. 428-514.000.
Minami, Norio: *See—*
Nakagawa, Isao; and Minami, Norio, 4,291,335, Cl. 358-154.000.
Minamizono, Junji; Yoneyama, Masakazu; and Sasaki, Jun, to Fuji Photo Film Co., Ltd. Method for dispersing photographic additives. 4,291,113, Cl. 430-202.000.

Minchey, Richard L.: *See—*
Gallagher, Ronald M.; Nadler, Michael E.; Highsmith, Charles E.; and Minchey, Richard L., 4,290,370, Cl. 108-53.500.

Minigrip, Inc.: *See—*
Schmidt, John, 4,290,467, Cl. 150-3.000.

Minnesota Mining and Manufacturing Company: *See—*
Balchunis, Robert J.; and Bany, Stephen W., 4,291,145, Cl. 528-89.000.
Berggren, William R.; and Brownley, Shelby J., 4,291,114, Cl. 430-253.000.
Giorgini, Norman L., 4,290,691, Cl. 355-3.0FU.
Johnson, James R.; and Flanagan, William C., Jr., 4,290,847, Cl. 176-1.000.
Kalleberg, Melvin O., 4,290,174, Cl. 24-204.000.
Kalleberg, Melvin O., 4,290,832, Cl. 156-72.000.

Minning, Manfred: *See—*
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,290,397, Cl. 123-195.00A.

Minolta Camera Kabushiki Kaisha: *See—*
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Minorikawa, Hitoshi: *See—*
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.

Misawa, Yoshihiko: *See—*
Taki, Yasuo; Araki, Shigeru; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,290,732, Cl. 414-752.000.

Mischke, Robert J.: *See—*
Wynosky, Thomas A.; Campbell, Charles A.; and Mischke, Robert J., 4,290,262, Cl. 60-262.000.

Misu, Hiroshi: *See—*
Kobayashi, Tomoyuki; Usami, Toshimasa; Misu, Hiroshi; and Sera, Hidefumi, 4,291,120, Cl. 430-531.000.

Misumi, Akira: *See—*
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.

Mitchell, Robert M., to Thomas J. Lipton, Inc. Infusion package and method of making same. 4,290,521, Cl. 206-0.500.

Mitoff, Stephan P.: *See—*
DeCarlo, Vincent J.; Powers, Robert W.; and Mitoff, Stephan P., 4,291,108, Cl. 429-193.000.

Mitre Corporation, The: *See—*
Weinberg, Aaron; Ebert, Paul M.; Fee, Joseph J.; Kaminsky, Yaroslav; Keblawi, Feisal S.; and Scales, Walter C., 4,291,409, Cl. 375-1.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Tsukahara, Hirokazu; Fuchigami, Mitsuru; and Kagota, Nobuhiro, 4,291,102, Cl. 428-537.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Hattori, Satoru, 4,291,140, Cl. 525-321.000.
Sato, Hideo; and Yagi, Toshio, 4,291,138, Cl. 525-247.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, 4,291,097, Cl. 428-412.000.

Mitsui Petrochemical Industries Ltd.: *See—*
Toyota, Akinori; and Kashiwa, Norio, 4,290,915, Cl. 252-429.00B.

Mittelstadt, Robert A. Wobble plate exercise device and toy. 4,290,601, Cl. 272-146.000.

Miura, Hiroshi: *See—*
Harada, Kiyoshi; Koida, Yoshiyuki; and Miura, Hiroshi, 4,290,910, Cl. 252-312.000.

Miura, Masahiro. Installation for cultivation of crops on water. 4,290,229, Cl. 47-66.000.

Miwa, Takayasu, heir: *See—*
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.

Miyabayashi, Mitsutaka: *See—*
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Hattori, Satoru, 4,291,140, Cl. 525-321.000.

Miyake, Hideo; Sakamoto, Junichi; Sawaki, Masakazu; and Hara, Mamoru, to Toyo Boseki Kabushiki Kaisha Co., Ltd. Thermosetting injection molding compound. 4,290,938, Cl. 260-40.00R.

Miyasaka, Kiyoshi: *See—*
Higuchi, Mitsuo; and Miyasaka, Kiyoshi, 4,291,326, Cl. 357-51.000.

Miyatake, Takafumi: *See—*
Mese, Michihiro; Kashioka, Seiji; Ejiri, Masakazu; Miyatake, Takafumi; Yamazaki, Isamu; and Hamada, Toshimitsu, 4,291,334, Cl. 358-101.000.

Miyauchi, Seiroku; Sagane, Yasuo; and Irie, Kazuo, to Asahi Glass Company, Limited. Metallic panel reinforcing system. 4,290,641, Cl. 296-146.000.

Miyazawa, Tatsuo: *See—*
Uesugi, Nobuo; Miyazawa, Tatsuo; Furudate, Mituaki; Sasaki, Keiichi; and Mizuguchi, Hiroji, 4,290,849, Cl. 176-19.00R.

Miyoshi, Hitoshi: *See—*
Kimura, Tsutomu; Miyoshi, Hitoshi; and Mori, Sumio, 4,291,305, Cl. 340-734.000.

Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, to Nissan Motor Company, Limited. Navigational information announcing system for motor vehicle. 4,291,373, Cl. 364-443.000.

Mizuguchi, Hiroji: *See—*
Uesugi, Nobuo; Miyazawa, Tatsuo; Furudate, Mituaki; Sasaki, Keiichi; and Mizuguchi, Hiroji, 4,290,849, Cl. 176-19.00R.

Mizzi, John V., to International Business Machines Corporation. Apparatus for providing a constant density trace of ECG analog signals. 4,291,315, Cl. 346-76.00R.

Mobay Chemical Corporation: *See—*
Loane, Charles M., Jr., 4,290,809, Cl. 75-257.000.

Mobil Oil Corporation: *See—*
Chen, Albert C., 4,291,055, Cl. 424-298.000.
Kaeding, Warren W., 4,291,185, Cl. 585-467.000.
Weiner, Milton L., 4,291,092, Cl. 428-349.000.

Mobil Tyco Solar Energy Corporation: *See—*
Yates, Douglas A.; Hatch, Arthur E.; and Goldsmith, Jeff M., 4,290,835, Cl. 156-601.000.

Mochizuki, Yasuhiro; Okano, Sadao; and Ogawa, Takuzo, to Hitachi, Ltd. Method of selectively diffusing aluminium into a silicon semiconductor substrate. 4,290,830, Cl. 148-187.000.

MoDo-Chemetics AB: *See—*
Hedstrom, Bengt O. A.; and Svensson, Claes G. S., 4,290,269, Cl. 60-670.000.

Moench, Jerry D.: *See—*
Martino, William L., Jr.; and Moench, Jerry D., 4,291,246, Cl. 307-475.000.

Moertel, George B., to Textron Inc. Slide fastener with molded elements and method of manufacture. 4,290,175, Cl. 24-205.13D.

Mogi, Takaaki: *See—*
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,291,373, Cl. 364-443.000.

Moldex, Inc.: *See—*
Paine, Ellis H.; and Anderson, Roger E., 4,290,711, Cl. 403-358.000.

Moles, Warren H.: *See—*
Rhodes, Roland N.; Schroeder, Alfred C.; and Moles, Warren H., 4,290,671, Cl. 350-317.000.

Molgaard, Aage; and Graversen, Niels P. G., to Danfoss A/S. Rotary knob for thermostatic valves of radiators. 4,290,553, Cl. 236-42.000.

Molins Limited: *See—*
Dyett, Derek H.; Hirsh, Ivan Y.; Preston, Edward G.; and Williams, Robert E., 4,290,518, Cl. 198-450.000.

Moll, Eberhard, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Sealing construction for vacuum connection. 4,290,614, Cl. 277-205.000.

Molter, Michael: *See—*
Strecker, Helmut; Molter, Michael; Kloss, Gerhard; and Schickel, Eberhard, 4,291,012, Cl. 424-1.000.

Momiyama, Kikuo: *See—*
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,290,686, Cl. 354-289.000.

Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,290,358, Cl. 101-111.000.
Pabodie, Robert M., 4,290,839, Cl. 156-384.000.
Pabodie, Robert M.; and Hamisch, Paul H., Jr., 4,290,840, Cl. 156-384.000.

Monsanto Company: *See—*
Bishkin, David B., 4,291,189, Cl. 585-860.000.
Morita, Eiichi, 4,291,141, Cl. 525-351.000.
Wilkie, Arnold E., 4,290,378, Cl. 112-410.000.

Montedison S.p.A.: *See—*
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.
Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,290,961, Cl. 260-397.400.

Monter, James V.; Sorenson, James P.; and Theus, George J., to Babcock & Wilcox Company, The. High temperature reference electrode. 4,290,872, Cl. 204-195.00F.

Montgomery, Carl T., to Dow Chemical Co., The. Method for facilitating transportation of particulate on a conveyor belt in a cold environment. 4,290,810, Cl. 106-13.000.

Montgrain, Luc, to Alcan Research and Development Limited. Apparatus for sparging molten metal by gas injection. 4,290,590, Cl. 266-225.000.

Montreal Neurological Institute: *See—*
Thompson, Christopher J., 4,291,228, Cl. 250-363.00S.

Moran, George A.; and Williams, John B., to ACF Industries, Incorporated. Seat assembly for ball valves. 4,290,581, Cl. 251-172.000.

Morel, Henri, to ITW de France, FRX. Closure for sealing openings in panels. 4,290,536, Cl. 220-359.000.

Morgan, Gordon L.; and Wood, John C. Spray booth. 4,290,348, Cl. 98-115.05B.

Mori, Fumio: *See—*
Aisaka, Tatsuyoshi; Kawai, Mitsuo; Mori, Fumio; and Sugai, Shinzo, 4,290,828, Cl. 148-11.50Q.

Mori, Kazuhiro: *See—*
Taki, Yasuo; Araki, Shigeru; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,290,732, Cl. 414-752.000.

Mori, Kunio: *See—*
Koshiishi, Hiromichi; Mori, Kunio; Sato, Hiroshi; and Sakaida, Akira, 4,290,829, Cl. 148-130.000.

Mori, Sumio: *See—*
Kimura, Tsutomu; Miyoshi, Hitoshi; and Mori, Sumio, 4,291,305, Cl. 340-734.000.

Morihara, Ko: *See*—
Hayashi, Kohtaro; Morihara, Ko; and Nakamura, Kohji, 4,290,996, Cl. 264-564.000.

Morikawa, Masanobu: *See*—
Tanaka, Chiaki; Morikawa, Masanobu; and Kohno, Yoshio, 4,290,927, Cl. 260-3.000.

Morino, Toshiharu: *See*—
Takada, Shigetaka; and Morino, Toshiharu, 4,290,399, Cl. 123-439.000.

Morita, Eiichi, to Monsanto Company. Vulcanizable rubber compositions containing N-(sulfenyl) methacrylamides as scorch inhibitors. 4,291,141, Cl. 525-351.000.

Morita, Minoru; Sato, Shimio; Hashimoto, Takao; and Kitaoka, Yoji, to Yamagata University, The President of. Apparatus for direct liquefaction. 4,290,999, Cl. 422-194.000.

Morita, Yoichi: *See*—
Noda, Nobutaka; Hamamura, Kazuo; and Morita, Yoichi, 4,290,690, Cl. 355-3.00R.

Mortl, Michael: *See*—
Fleckenstein, Andrew; and Mortl, Michael, 4,290,451, Cl. 137-624.150.

Morton, Douglas R., Jr., to Upjohn Company, The. 9,11-Dideoxy-10-oxa-TXB intermediates. 4,291,159, Cl. 542-400.000.

Morton, John C., to Clamor Company. Hand truck stair tread engaging device. 4,290,618, Cl. 280-5.220.

Morton-Norwich Products, Inc.: *See*—
Wright, George C.; and White, Ronald E., 4,291,163, Cl. 546-164.000.

Mostek Corporation: *See*—
McKenny, Vernon G.; and Chan, Tsiu C., 4,290,185, Cl. 29-571.000.
Proebsting, Robert J., 4,291,392, Cl. 365-203.000.
Wilson, Dennis R., 4,291,393, Cl. 365-203.000.

Motoren-und-Turbinen-Union Friedrichshafen GmbH: *See*—
Meeh, Wilhelm, 4,290,270, Cl. 60-716.000.

Motorola Inc.: *See*—
Martino, William L., Jr.; and Moench, Jerry D., 4,291,246, Cl. 307-475.000.
Schriber, Gene A., 4,291,242, Cl. 307-270.000.

Mould, Henry M.; and Hirst, George E., to Perkin-Elmer Limited. Spectrophotometric system. 4,290,696, Cl. 356-300.000.

Moutonnier, Claude: *See*—
Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,291,032, Cl. 424-248.510.

MTS Systems Corporation: *See*—
Gram, Martin M., 4,290,343, Cl. 91-461.000.

MTU Motoren-und Turbinen Union: *See*—
Betz, Wolfgang; and Rossmann, Axel, 4,290,845, Cl. 156-644.000.

Muehlbauer, Otto; Bigall, Klaus D.; and Roessler, Helmut, to Siemens Aktiengesellschaft. Digital semiconductor circuit. 4,291,221, Cl. 235-92.0CC.

Mulinos, Michael G., to Unimed, Inc. Method of lowering blood cholesterol. 4,291,030, Cl. 424-245.000.

Muller, Horst; and Vorwerk, Helmut, to Robert Bosch GmbH. Remote control for radiotelephones. 4,291,411, Cl. 455-88.000.

Muller, Werner C.; and Miller, Franklyn D., to National Distillers and Chemical Corp. Process for the acid hydrolysis of carbohydrate polymers and the continuous fermentation of the sugars obtained therefrom to provide ethanol. 4,291,124, Cl. 435-162.000.

Mundell, Robert D. Method and apparatus for installing a wheel cover. 4,291,077, Cl. 428-76.000.

Muntwyler, Rene, to Ciba-Geigy Corporation. Method of protecting organic or inorganic material from attack by microorganisms. 4,290,846, Cl. 162-161.000.

Murakami, Hiroyasu: *See*—
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,290,686, Cl. 354-289.000.

Murakami, Keikichi; and Kaneko, Hideo, to Kawasaki Jukogyo Kabushiki Kaisha. Method and apparatus for probing into a refining furnace or the like for temperature measurement for sampling, or for both. 4,290,306, Cl. 73-354.000.

Murakami, Kenkichi; and Kikuzawa, Yoshiharu, to Kabushiki Kaisha Plastic Kogaku Kenkyusho. Method of molding hollow bodies. 4,290,994, Cl. 264-515.000.

Murakami, Yasushi: *See*—
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.

Muraki, Toshio, to Toray Industries, Incorporated. Highly rigid polyamide composition. 4,290,935, Cl. 260-32.6NA.

Muramatsu, Katsuji; and Fujita, Yoshihiro, to Fuji Photo Film Co., Ltd. Photographic camera. 4,290,680, Cl. 354-203.000.

Murata Manufacturing Co., Ltd.: *See*—
Kadota, Michio, 4,291,285, Cl. 333-150.000.
Nishiyama, Hiroshi; Nakamura, Takeshi; Kato, Suehiro; and Ando, Kenji, 4,290,876, Cl. 204-298.000.

Murayama, Noboru: *See*—
Ogawa, Mutsuo; Murayama, Noboru; Konishi, Akira; and Takeuchi, Norisada, 4,291,339, Cl. 358-260.000.

Murdoch, James C.: *See*—
Stevenson, Andrew C.; Herzog, Gordon W.; and Murdoch, James C., 4,291,263, Cl. 318-706.000.

Murozono, Izumi: *See*—
Takamura, Tooru; Terakawa, Sumio; Nakatani, Hirokuni; and Murozono, Izumi, 4,291,337, Cl. 358-213.000.

Murphy, Jimmy L.: *See*—
Trent, Jett B.; and Murphy, Jimmy L., 4,291,219, Cl. 219-121.0EY.

Muto, Naoki: *See*—
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.

Muzechuk, Richard A.: *See*—
Sullivan, Leo S., Jr.; and Muzechuk, Richard A., 4,290,626, Cl. 280-692.000.

Myhre, Kjell E. Transducer diaphragm elements and methods and apparatus for making same. 4,291,218, Cl. 219-121.0EC.

Nadenoff, Glenn L. Chain saw guard. 4,290,202, Cl. 30-382.000.

Nadler, Michael E.: *See*—
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Nagakura, Masahiko: *See*—
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.

Nagano, Masashi; and Someya, Itsuo, to Shimano Industrial Company Limited. Center-pull type calliper brake for a bicycle. 4,290,506, Cl. 188-24.190.

Nagata Seisakusho Co., Ltd.: *See*—
Takakuwa, Takeshi, 4,290,886, Cl. 210-219.000.

Nagy, Gabor: *See*—
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.

Nakae, Isoji, to Kishu Neji Co., Ltd. Self-locking nut-type or bolt-type fastening device. 4,290,469, Cl. 411-185.000.

Nakagami, Jozi: *See*—
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, 4,290,962, Cl. 260-397.450.

Nakagawa, Isao; and Minami, Norio, to Hitachi, Ltd. Vertical synchronizing signal detector. 4,291,335, Cl. 358-154.000.

Nakajima, Koichi; and Tsuchiya, Hidetaka, to Citizen Watch Co., Ltd. Plastic watch case. 4,291,402, Cl. 368-276.000.

Nakajima, Yoshinori, to Ricoh Company, Ltd. Servo positioning apparatus. 4,291,262, Cl. 318-603.000.

Nakakimura, Hiroshi: *See*—
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.

Nakamura, Kohji: *See*—
Hayashi, Kohtaro; Morihara, Ko; and Nakamura, Kohji, 4,290,996, Cl. 264-564.000.

Nakamura, Takeshi: *See*—
Nishiyama, Hiroshi; Nakamura, Takeshi; Kato, Suehiro; and Ando, Kenji, 4,290,876, Cl. 204-298.000.

Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Vertical type vapor-phase growth apparatus. 4,290,385, Cl. 118-730.000.

Nakano, Masao; Nakano, Tomio; Takemae, Yoshihiro; and Kabashima, Katsuhiko, to Fujitsu Limited. Semiconductor memory device having flip-flop circuits. 4,291,394, Cl. 365-206.000.

Nakano, Tomio: *See*—
Nakano, Masao; Nakano, Tomio; Takemae, Yoshihiro; and Kabashima, Katsuhiko, 4,291,394, Cl. 365-206.000.

Nakata, Kouji: *See*—
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, 4,291,010, Cl. 423-594.000.

Nakatani, Hirokuni: *See*—
Takamura, Tooru; Terakawa, Sumio; Nakatani, Hirokuni; and Murozono, Izumi, 4,291,337, Cl. 358-213.000.

Nakate, Yasushi; Iwai, Hiroshi; and Nanishi, Kiyoshi, to Kansai Paint Co., Ltd. One-pack high solid coating composition. 4,291,137, Cl. 525-162.000.

Nakayama, Akira: *See*—
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, 4,291,253, Cl. 313-348.000.

Nakmizo, Nobuhiro: *See*—
Hirata, Tadashi; Ogasa, Takehiro; Saito, Hiromitsu; and Nakmizo, Nobuhiro, 4,291,164, Cl. 546-183.000.

Nalco Chemical Company: *See*—
Allain, Ronald J.; and Maniscalco, Joseph P., 4,291,167, Cl. 556-430.000.

Nanishi, Kiyoshi: *See*—
Nakate, Yasushi; Iwai, Hiroshi; and Nanishi, Kiyoshi, 4,291,137, Cl. 525-162.000.

Nathan, Bernard D.; and Witter, Donald R., to General Electric Company. Transverse magnetic printing head. 4,291,314, Cl. 346-74.500.

National Distillers and Chemical Corp.: *See*—
Goetz, Richard W.; Meixsel, Lawrence D.; and Smith, David W., 4,291,179, Cl. 568-882.000.
Muller, Werner C.; and Miller, Franklyn D., 4,291,124, Cl. 435-162.000.

National Petro Chemicals Corp.: *See*—
Katzen, Stanley J.; and Rekers, Louis J., 4,290,914, Cl. 252-428.000.

National Semiconductor Corporation: *See*—
Carinalli, Charles P., 4,291,319, Cl. 357-13.000.
Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,290,186, Cl. 29-576.00B.

National-Standard Company: *See*—
Bryant, Emerson C., 4,290,472, Cl. 156-416.000.

Natmar, Inc.: *See*—
Clay, Bobby J., 4,290,357, Cl. 101-111.000.
Naumann, Rolf: *See*—
Schroeder, Gerhard; Buxbaum, Gunter; Hund, Franz; Schopper, Heinrich-Christian; and Naumann, Rolf, 4,290,799, Cl. 75-0.50A.
NCR Corporation: *See*—
Armstrong, Rolfe D., 4,291,407, Cl. 371-49.000.
Nelson, Hilding E., 4,291,366, Cl. 363-17.000.
Neefft, Rutger; Kuth, Robert; Kuhnel, Werner; and Gohrbandt, Wilhelm, to Bayer Aktiengesellschaft. Process for dyeing and printing cellulose fibres. 4,290,768, Cl. 8-532.000.
Neiman, Richard A.: *See*—
Bakermans, Johannes C. W.; and Neiman, Richard A., 4,290,179, Cl. 29-33.00M.
Nelson, Edward I., to Burroughs Corporation. Molded plastic photo-optical keyboard. 4,291,225, Cl. 250-229.000.
Nelson, Hilding E., to NCR Corporation. Switching regulated power supply. 4,291,366, Cl. 363-17.000.
Neturen Company Ltd.: *See*—
Fukuhara, Tetsukazu, 4,290,841, Cl. 156-464.000.
Neutrogena Corporation: *See*—
Poper, Maxwell H.; and Jungermann, Eric, 4,290,904, Cl. 252-118.000.
Newall, Christopher E.: *See*—
Cherry, Peter C.; Newall, Christopher E.; Watson, Nigel S.; Gregory, Gordon I.; and Ward, Peter, 4,290,949, Cl. 260-245.300.
Newton, Emerson H., to Wing Industries, Inc. Total energy exchange apparatus. 4,290,789, Cl. 55-269.000.
Newton, Robert E.: *See*—
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,291,273, Cl. 324-343.000.
NGK Insulators, Ltd.: *See*—
Suzuki, Kazuo, 4,290,743, Cl. 425-461.000.
NHK Spring Co., Ltd.: *See*—
Kawakubo, Mitsushige; Sakai, Yoshihiro; and Ohno, Akira, 4,290,288, Cl. 72-7.000.
Nichols, Donald A.: *See*—
Arnold, Donald S.; Fairchild, James L.; Nichols, Donald A.; and Coe, Merlin D., 4,291,002, Cl. 423-189.000.
Nicholson, Terence P. Gaskets. 4,290,616, Cl. 277-235.00B.
Nicksic, Edward E. Locking device for spoked wheel vehicles. 4,290,284, Cl. 70-233.000.
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., to Research Corporation. Pharmaceutically active 6,9-thiaprostacyclin analogs and derivatives thereof. 4,291,166, Cl. 549-51.000.
Nigol, Olaf; Houston, Herbert J.; and Gretzinger, Adolf, to Slater Steel Industries Limited. Negative corona shielding of line and station hardware. 4,291,194, Cl. 174-40.00R.
Nihon Tokushu Noyasu Seizo K.K.: *See*—
Kishino, Shigeo; Saito, Junichi; Kume, Toyohiko; and Isono, Kunihiro, 4,290,978, Cl. 260-973.000.
Nimmo, George R.: *See*—
King, Gordon A.; Nimmo, George R.; and Bial, Wolfgang, 4,291,302, Cl. 340-642.000.
Ninova, Maya H.: *See*—
Vlahov, Radoslav Y.; Krikoryan, Dikran A.; Zagorova, Maria S.; Ninova, Maya H.; and Parushev, Stoyan P., 4,290,862, Cl. 204-59.00R.
Nippon Aspherical Lens Co., Ltd.: *See*—
Tanaka, Mitsuaki; and Suzuki, Masaharu, 4,291,098, Cl. 428-412.000.
Nippon Fine Chemical Co., Ltd.: *See*—
Tanaka, Mitsuaki; and Suzuki, Masaharu, 4,291,098, Cl. 428-412.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ida, Masaru, 4,291,276, Cl. 330-85.000.
Kimura, Shigenobu, 4,291,414, Cl. 455-164.000.
Nippon Kogaku K.K.: *See*—
Shirasu, Hiroshi; Ogasawara, Akira; and Utagawa, Ken, 4,291,224, Cl. 250-204.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Matsudo, Kazuo; Adaniya, Takeshi; Ohmura, Masaru; Shoji, Masahiro; and Watanabe, Tsutomu, 4,290,860, Cl. 204-27.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Tanizaki, Yoshiharu; Minagawa, Kenichiro; Akimoto, Shinichi; and Horioka, Kuninori, 4,291,101, Cl. 428-514.000.
Nippon Sanso K. K.: *See*—
Suwa, Toshio; Konagaya, Yoshiaki; and Ishii, Hiroshi, 4,290,555, Cl. 239-8.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Ueda, Takeo; and Asano, Shuichi, 4,290,629, Cl. 280-806.000.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,290,301, Cl. 73-35.000.
Nippon Steel Corporation: *See*—
Koshiishi, Hiromichi; Mori, Kunio; Sato, Hiroshi; and Sakaida, Akira, 4,290,829, Cl. 148-130.000.
Nippon Tsusho Company Limited: *See*—
Suginaka, Mutsuo, 4,290,761, Cl. 474-190.000.
Nippondenso Co., Ltd.: *See*—
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.
Iyoda, Michio; and Abe, Shigeya, 4,290,406, Cl. 123-645.000.
Kitano, Takio, 4,291,237, Cl. 307-10.0AT.
Nishida, Minoru: *See*—
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.
Nishihara, Motohisa: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.
Nishimura, Sadanori, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for control of oil pressure operated type transmission for vehicle. 4,290,325, Cl. 74-869.000.
Nishimura, Sadanori; and Yamada, Yoji, to Honda Giken Kogyo Kabushiki Kaisha. Operation oil supply apparatus in oil pressure operated type transmission for vehicle. 4,290,513, Cl. 192-3.220.
Nishiyama, Hiroshi; Nakamura, Takeshi; Kato, Suehiro; and Ando, Kenji, to Murata Manufacturing Co., Ltd. Sputtering apparatus. 4,290,876, Cl. 204-298.000.
Nishizawa, Eiji: *See*—
Ijichi, Sadayoshi; and Nishizawa, Eiji, 4,291,290, Cl. 334-1.000.
Nissan Chemical Industries, Ltd.: *See*—
Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, 4,291,127, Cl. 560-76.000.
Nissan Motor Company, Limited: *See*—
Hata, Yoshitaka; and Okamura, Kenji, 4,290,404, Cl. 123-571.000.
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,291,373, Cl. 364-443.000.
Okuyama, Hiroo, 4,290,628, Cl. 280-803.000.
Ookubo, Takashi; and Sasabe, Yukiyoshi, 4,290,318, Cl. 74-477.000.
Takahashi, Koichi; and Higuchi, Megumu, 4,290,452, Cl. 137-625.230.
Nissen, Peter: *See*—
Appel, Eggert; Nissen, Peter; Geisler, Gottfried; and Kiene, Wilfried, 4,290,313, Cl. 73-861.170.
Nisshin Steel Company, Ltd.: *See*—
Maruhashi, Shigeaki; Hasegawa, Morihiro; and Yamauchi, Takashi, 4,290,803, Cl. 75-52.000.
Nittetsu Bolten Kabushiki Kaisha: *See*—
Kuwata, Takeo; Shimada, Shoji; and Usa, Mikio, 4,290,337, Cl. 411-2.000.
Nixon, John M. Motor velocity control servo amplifier. 4,291,260, Cl. 318-331.000.
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., to Rockwell International Corporation. Free-rotor gas-bearing gyroscope having electromagnetic rotor restraint and acceleration output signal. 4,290,316, Cl. 74-5.460.
Noble, Henry J., III: *See*—
Pardue, James I., Jr.; Hornsby, William M.; and Noble, Henry J., III, 4,290,245, Cl. 52-157.000.
Noda, Nobutaka; Hamamura, Kazuo; and Morita, Yoichi, to Kabushiki-Kaisha K I P. Device for controlling potential of latent image for use in electrophotographic apparatus. 4,290,690, Cl. 355-3.00R.
Noguchi, Takanobu: *See*—
Yasui, Seimei; Sagou, Masakazu; Noguchi, Takanobu; Toyoshima, Yoshiki; and Saito, Junzo, 4,291,148, Cl. 528-142.000.
Nogueira, Eduardo D.; Infanzon, Luis Alonso S.; and Tezanos, Enrique H. Process for electrolysis of brine by mercury cathodes. 4,290,863, Cl. 204-99.000.
Nolken, Ernst, to Hoechst Aktiengesellschaft. Aqueous vinyl plastics dispersion containing water soluble salt of polybasic phosphonic acid derivative. 4,290,930, Cl. 260-29.6MP.
Nolken, Ernst; and Oesterlin, Hans G., to Hoechst Aktiengesellschaft. Aqueous plastics dispersion on the basis of vinyl ester polymers, process for the manufacture thereof, and coating material made therefrom. 4,290,931, Cl. 260-29.6RW.
Nomura, Hiroyuki: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,291,373, Cl. 364-443.000.
Noonan, John M.; and McConkey, Robert C., to Eastman Kodak Company. Water-dispersible polyester adhesives for photographic materials. 4,291,153, Cl. 528-290.000.
Nopper, Herbert; and Knoch, Wolfgang, to Casimir Kast GmbH & Co. KG. Method for the manufacture of cellulosic fibrous material which can be pressed into moulded parts. 4,290,988, Cl. 264-112.000.
Nordeen, Donald L.: *See*—
Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., 4,290,627, Cl. 280-729.000.
North American Philips Controls Corp.: *See*—
Merchant, Donald K., 4,291,291, Cl. 335-191.000.
Northern Engineering Industries Ltd.: *See*—
Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., 4,291,208, Cl. 200-148.00A.
Northern Instruments Corporation: *See*—
Boerwinkle, Fred P.; and Kubik, Donald A., 4,290,912, Cl. 252-389.00R.
Northern Telecom, Inc.: *See*—
Adams, William J.; Wernet, William F.; and Haskins, Steve W., 4,291,202, Cl. 179-103.000.

Northern Telecom Limited: *See*—
Hinz, Lorne C.; and Thomas, William P., 4,291,299, Cl. 340-347.0AD.
Trumble, William P., 4,291,094, Cl. 428-380.000.
Northrop Corporation: *See*—
Olez, Nejat A., 4,291,081, Cl. 428-119.000.
Northwestern University: *See*—
Goldberg, Erwin, 4,290,944, Cl. 260-112.50R.
Nossen, Edward J., to RCA Corporation. System and method for frequency discrimination. 4,291,269, Cl. 324-79.00D.
Nossen, Edward J., to RCA Corporation. Frequency demodulation system. 4,291,275, Cl. 329-112.000.
Nougaret, Jean-Pierre, to Sandoz Ltd. Enteric coated mixture of 4-(2-hydroxy-3-isopropylamino-propoxy) indole and sodium lauryl sulphate. 4,291,016, Cl. 424-35.000.
Novametrix Medical Systems, Inc.: *See*—
Herbert, Normand C.; Burwen, Richard S.; and Mentelos, Richard A., 4,290,431, Cl. 128-635.000.
Novgorodov, Alexandr S.: *See*—
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.
Novikov, Albert P.: *See*—
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.
Nowlin, Thomas E.; and Raschke, Curt R., to Union Carbide Corporation. Electrets. 4,291,245, Cl. 307-400.000.
Nyfeler, Robert: *See*—
Sturm, Elmar; and Nyfeler, Robert, 4,291,061, Cl. 424-331.000.
Oas, David C., to Beloit Corporation. Method of producing articles from thermoplastic parisons. 4,290,995, Cl. 264-532.000.
Obergfell, Walter: *See*—
Wolber, Robert; and Obergfell, Walter, 4,291,210, Cl. 200-252.000.
O'Brokta, Ronald D.: *See*—
Lessmann, Gerald G.; Simpson, Ronald P.; Reichenecker, William J.; and O'Brokta, Ronald D., 4,291,220, Cl. 219-137.00R.
Occhialini, Carlo, to Samputensili S.p.A. Tools for bevelling and deburring gears. 4,290,718, Cl. 409-8.000.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,290,649, Cl. 299-2.000.
O'Connor, Dermot. Talking mailbox structure and method. 4,291,342, Cl. 360-12.000.
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, to Asahi Glass Company, Ltd. Process for preparing electrode. 4,290,859, Cl. 204-16.000.
Oeda, Ichiro; and Sano, Isao, to Kanebo Ltd. Lipstick of the core-sheath type. 4,291,018, Cl. 424-64.000.
Oesterlin, Hans G.: *See*—
Nolken, Ernst; and Oesterlin, Hans G., 4,290,931, Cl. 260-29.6RW.
O'Farrell, Patrick H., to University of California, The Regents of the. Method of isotope enrichment. 4,290,855, Cl. 204-1.500.
Ogasa, Takehiro: *See*—
Hirata, Tadashi; Ogasa, Takehiro; Saito, Hiromitsu; and Nakmizo, Nobuhiro, 4,291,164, Cl. 546-183.000.
Ogasawara, Akira: *See*—
Shirasu, Hiroshi; Ogasawara, Akira; and Utagawa, Ken, 4,291,224, Cl. 250-204.000.
Ogasawara, Makoto: *See*—
Inata, Hiroo; Matsumura, Shunichi; and Ogasawara, Makoto, 4,291,152, Cl. 528-289.000.
Ogawa, Kazuo; and Suzuki, Eiji, to Fujitsu Limited. System for monitoring bit errors. 4,291,408, Cl. 371-49.000.
Ogawa, Masahiko: *See*—
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,291,223, Cl. 250-201.000.
Ogawa, Mutsuo; Murayama, Noboru; Konishi, Akira; and Takeuchi, Norisada, to Ricoh Company, Ltd. Facsimile transceiver. 4,291,339, Cl. 358-260.000.
Ogawa, Takuzo: *See*—
Mochizuki, Yasuhiro; Okano, Sadao; and Ogawa, Takuzo, 4,290,830, Cl. 148-187.000.
Ogawa, Yoshihisa: *See*—
Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, 4,291,127, Cl. 560-76.000.
Ogi, Keisuke: *See*—
Kato, Masaaki; and Ogi, Keisuke, 4,291,332, Cl. 358-19.000.
Ohdan, Kyoji: *See*—
Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; and Kurafuji, Toshio, 4,290,922, Cl. 252-456.000.
Ohira, Tsunehisa, to Victor Company of Japan, Ltd. Cassette type tape recorder. 4,291,345, Cl. 360-62.000.
Ohishi, Chikashi; and Hasegawa, Akira, to Fuji Photo Film Co., Ltd. Plate making process with novel use of surfactant. 4,291,117, Cl. 430-309.000.
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, to Sony Corporation; and Sumitomo Metal Mining Co., Ltd. Grid structure for color picture tube. 4,291,253, Cl. 313-348.000.
Ohmae, Tsutcmu: *See*—
Marumoto, Katsuji; and Ohmae, Tsutcmu, 4,291,259, Cl. 318-139.000.
Ohmura, Masaru: *See*—
Matsudo, Kazuo; Adaniya, Takeshi; Ohmura, Masaru; Shoji, Masahiro; and Watanabe, Tsutomu, 4,290,860, Cl. 204-27.000.
Ohno, Akira: *See*—
Kawakubo, Mitsushige; Sakai, Yoshihiro; and Ohno, Akira, 4,290,288, Cl. 72-7.000.
Ohwada, Masataka: *See*—
Saito, Takashi; Ohwada, Masataka; and Saito, Shozo, 4,290,906, Cl. 252-301.10W.
Ohyama, Eiji: *See*—
Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, 4,291,127, Cl. 560-76.000.
Oishi, Kazuaki, to Hitachi, Ltd. Gas-insulated switchgear apparatus. 4,291,363, Cl. 361-333.000.
Oka, Takashi: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,291,373, Cl. 364-443.000.
Okada, Kunihiro: *See*—
Kodama, Kazuyuki; Okada, Kunihiro; Huno, Takakazu; Endo, Takeyuki; and Shibuya, Yasutaka, 4,291,306, Cl. 340-744.000.
Okamura, Kenji: *See*—
Hata, Yoshitaka; and Okamura, Kenji, 4,290,404, Cl. 123-571.000.
Okano, Sadao: *See*—
Mochizuki, Yasuhiro; Okano, Sadao; and Ogawa, Takuzo, 4,290,830, Cl. 148-187.000.
Okubo, Kunio, to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Filter apparatus and filter support frames. 4,290,790, Cl. 55-379.000.
Okuyama, Hideo, to Kanto Seiki Company, Limited. Apparatus for driving a deflecting coil type meter. 4,291,268, Cl. 324-76.00R.
Okuyama, Hiroo, to Nissan Motor Co., Ltd. Passive seat belt equipment. 4,290,628, Cl. 280-803.000.
Olez, Nejat A., to Northrop Corporation. Laced composite structure. 4,291,081, Cl. 428-119.000.
Olin Corporation: *See*—
Boudakian, Max M., 4,291,165, Cl. 546-345.000.
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,290,833, Cl. 156-94.000.
Olivieri, Roberto: *See*—
Degen, Ludwig; Branduzzi, Paolo; Olivieri, Roberto; and Cimini, Nadia, 4,291,123, Cl. 435-94.000.
Olmstead, John A.: *See*—
Kessler, Sebastian W., Jr.; and Olmstead, John A., 4,291,324, Cl. 357-36.000.
Olofsson, Mats: *See*—
Buhler, Marcel; Olofsson, Mats; and Fosseux, Pierre-Yves, 4,291,067, Cl. 426-582.000.
Olson, Richard A., to Hydril Company. Blowout preventer ram lock. 4,290,577, Cl. 251-1.00A.
Olszok, Henry: *See*—
Brause, Joachim; Gerhard, Thomas; Keller, Manfred; and Olszok, Henry, 4,290,367, Cl. 104-105.000.
Olympia Werke AG: *See*—
Fischbeck, Karl-Heinz, 4,291,103, Cl. 428-589.000.
Loock, Ehrenfried, 4,290,812, Cl. 106-22.000.
Olympus Optical Company Limited: *See*—
Kimura, Kenji, 4,291,344, Cl. 360-36.000.
Maitani, Yoshihisa; and Tsunefuji, Katsuhiko, 4,290,681, Cl. 354-230.000.
Omori, Takashi; and Sato, Takao, to Hitachi, Ltd. Method and apparatus for controlling feedwater flow to steam generating device. 4,290,850, Cl. 176-20.00R.
Omura, Takayoshi: *See*—
Matsui, Kunio; Tsuchiya, Hiroaki; Suzuki, Ryushi; and Omura, Takayoshi, 4,290,791, Cl. 55-399.000.
One Design, Inc.: *See*—
Maloney, Timothy, 4,290,416, Cl. 126-430.000.
Onishi, Kenji: *See*—
Washio, Isomi; and Onishi, Kenji, 4,290,330, Cl. 83-820.000.
Ono, Masaru: *See*—
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and by Miwa, Takayasu, heir, to Kowa Company Limited. Tetrahydroxanthone derivatives. 4,290,954, Cl. 260-335.000.
Ookubo, Takashi; and Sasabe, Yukiyoshi, to Nissan Motor Co., Ltd. Operating mechanism of a transfer unit. 4,290,318, Cl. 74-477.000.
Ootsuka, Yoshinori: *See*—
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,290,301, Cl. 73-35.000.
Opitz, Rigobert; and Flach, Juergen, to Rheinmetall GmbH. Arrangement for removal of residues and sediments from the interior surfaces of barrels of weapons. 4,290,163, Cl. 15-104.090.
Optilon W. Erich Heilmann GmbH: *See*—
Wulz, Helmut, 4,290,176, Cl. 24-205.16R.
Orelski, Paula A., to American Sterilizer Company. Biological indicator for sterilization processes. 4,291,122, Cl. 435-31.000.
Osborne, Neal F.: *See*—
Brain, Edward G.; and Osborne, Neal F., 4,290,948, Cl. 260-245.20R.

Osborne, Thomas E.; and Stockwell, Richard K., to Hewlett-Packard Company. Calculator having merged key codes. 4,291,385, Cl. 364-709.000.

Oschwald, Max: *See—*
Boller, Hans; and Oschwald, Max, 4,290,219, Cl. 42-1.00R.

Ostenberg, John R.; and Ligas, Kenneth M., to Creative Anglers. Fisherman's leader/line dispenser and decoiler. 4,290,223, Cl. 43-54.50R.

Ota, Hiroshi: *See—*
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,291,100, Cl. 428-424.200.

Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, to Toyo Jozo Company, Ltd. Novel macrolide antibiotics and preparation thereof. 4,291,021, Cl. 424-121.000.

Otouma, Hiroshi: *See—*
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,290,859, Cl. 204-16.000.

Otto, Jack C.: *See—*
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,290,865, Cl. 204-106.000.

Otto Kuhlmann GmbH & Co. KG: *See—*
Pfeiffer, Herbert, 4,290,471, Cl. 152-362.00R.

Overeem, Jan C.: *See—*
Bosone, Enrico; Camaggi, Giovanni; de Vries, Lambertus; Garavaglia, Carlo; Garlaschelli, Luigi; Gozzo, Franco; Overeem, Jan C.; and Lorusso, Simone, 4,291,049, Cl. 424-275.000.

Owen, Harry; and Barrow, Thomas, to Pilkington Brothers Limited. Photochromic boro-silicate glass. 4,290,813, Cl. 501-13.000.

Owens-Corning Fiberglass Corporation: *See—*
Chase, Kenneth P.; and McCoy, Dale E., 4,291,095, Cl. 428-391.000.

Owens-Illinois, Inc.: *See—*
Hafferkamp, Harry C., 4,290,517, Cl. 198-427.000.
Kontz, Robert F., 4,290,745, Cl. 425-541.000.
Koschmann, John E., 4,290,986, Cl. 264-40.300.
Rupp, Thomas F.; and Wells, Lowell J., 4,290,533, Cl. 215-1.00R.

Oy Partek AB: *See—*
Sutela, Leo; and Laitinen, Heikki, 4,290,726, Cl. 414-421.000.

P C U K Produits Chimiques Ugine Kuhlmann: *See—*
Rau, Manfred C., 4,290,770, Cl. 8-662.000.

P.I.V. Antrieb Werner Reimers Kommanditgesellschaft: *See—*
Abbott, Randle L., 4,290,320, Cl. 74-689.000.

Pabodie, Robert M., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,290,839, Cl. 156-384.000.

Pabodie, Robert M.; and Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,290,840, Cl. 156-384.000.

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Halasa, Adel F.; Hall, James E.; and Para, Adolph, 4,291,139, Cl. 525-314.000.

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Lichti, Robert D.; and Hock, Frederick D. (said Frederick D. Hock assors. to), 4,290,724, Cl. 414-251.000.

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Mann, Gamdur S.; Tendulkar, Dilip V.; and Parker, William J., 4,290,263, Cl. 60-311.000.

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von Hagel, Gunter; and Berlenbach, Norbert, 4,290,898, Cl. 210-738.000.

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Liao, John C.; Patel, Chittaranjan P.; and Ponzo, John L., 4,290,769, Cl. 8-602.000.

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Arlt, Joachim; and Fromm, Dietrich, 4,291,254, Cl. 315-240.000.

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Patton, Charles C., to Sangamo-Weston, Inc. Remote receiver for load and rate control in a power transmission system. 4,291,236, Cl. 307-40.000.

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Corwin, William C.; and Pawlak, Raymond M., 4,291,317, Cl. 346-140.00R.

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Pedersen, John R. C. Vaporization means for liquid fuel. 4,290,401, Cl. 123-524.000.

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Glickman, Michael; and Hollington, Geoffrey A., 4,290,645, Cl. 297-239.000.

Pellico, Michael A., to Laclede Professional Products, Inc. Agar gel topical dressing. 4,291,025, Cl. 424-180.000.

Pelsy, Gilles. Driving machine including speed synchronized earth working traction wheel. 4,290,488, Cl. 172-123.000.

Pelton, John F., to Union Carbide Corporation. Apparatus for refining molten aluminum. 4,290,588, Cl. 266-225.000.

Penman, Dexter D. Floating marina. 4,290,381, Cl. 114-263.000.

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Perkin-Elmer Corporation, The: *See—*
Ausschnitt, Christopher P.; and Huchital, David A., 4,290,384, Cl. 118-722.000.

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Mould, Henry M.; and Hirst, George E., 4,290,696, Cl. 356-300.000.

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Permabond International Corp.: *See—*
McIntire, John M.; and Blair, Richard H., 4,291,131, Cl. 525-5.000.

Petaja, Gary M.: *See—*
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Peters, Margot E.: *See—*
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Pfeiffer, Wolfgang: *See*—
Dettmann, Heinrich; and Pfeiffer, Wolfgang, 4,291,358, Cl. 361-154.000.
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Browning, James S.; Pfeiler, Peter F.; and Lowery, Vernon, 4,290,207, Cl. 33-295.000.
Pfender, Thomas E., to Creative Craftsmen, Inc. Spraying arrangement. 4,290,383, Cl. 118-630.000.
Pfizer Inc.: *See*—
Kraska, Allen R., 4,291,060, Cl. 424-316.000.
Pfleiderer, Hans-Jorg; and Widmann, Dietrich, to Siemens Aktiengesellschaft. MIS-field effect transistor having a short channel length and method of making the same. 4,291,321, Cl. 357-23.000.
Phares Pharmaceutical Research N.V.: *See*—
Leigh, Steven; and Ayres, Peter J., 4,291,062, Cl. 424-322.000.
Phillips, Howard M.: *See*—
Free, Dustin L.; and Phillips, Howard M., 4,290,485, Cl. 166-281.000.
Phillips Petroleum Company: *See*—
Banasiak, Dennis S., 4,291,187, Cl. 585-644.000.
Czenkusch, Edward L., 4,290,777, Cl. 44-1.0SR.
Lauffer, Donald E., 4,291,271, Cl. 324-307.000.
McKay, Dwight L.; Bertus, Brent J.; and Mark, Harold W., 4,290,919, Cl. 252-437.000.
Wishman, Marvin; Taylor, Peter A.; and Leininger, James C., 4,291,093, Cl. 428-379.000.
Pierson, James G.; and Wilmshurst, David A., to Queen's University at Kingston. Apparatus for controlling light transmission through a window. 4,290,473, Cl. 160-120.000.
Pigeon, Raymond, to Rhone-Poulenc Industries. Photopolymerizable organopolysiloxane/silane compositions. 4,290,869, Cl. 204-159.130.
Pikon, Jerzy; and Hehlmann, Jan, to Politechnika Slaska im. Wincentego Pstrowdkiego. Mass exchanger with packaging. 4,290,980, Cl. 261-94.000.
Pilkington Brothers Limited: *See*—
Owen, Harry; and Barrow, Thomas, 4,290,813, Cl. 501-13.000.
Pilny, Richard J., to Dow Chemical Company, The. Rendering porous structures impermeable by treatment with gellable amine polymers. 4,291,069, Cl. 427-140.000.
Pinard, Michel; Aminoff, Carl; Trenec, Gerard; and Laloe, Franck, to Agence National de Valorization de la Recherche. Single mode double Michelson-type laser cavity resonator. 4,291,281, Cl. 331-94.50C.
Pitney Bowes Inc.: *See*—
Dlugos, Daniel F., 4,291,374, Cl. 364-466.000.
Irvine, Robert, 4,290,593, Cl. 271-42.000.
Pittman, Robert R.; Elbrader, Clifford B.; and Milum, Jimmy L., to Emerson Electric Co. Electrostatic air cleaner and mounting means therefor. 4,290,788, Cl. 55-138.000.
Pohl, Walter J., to General Electric Company. Electronic thermostatic control for a heat/cool room air conditioning system. 4,290,481, Cl. 165-26.000.
Pointer, Carl W.: *See*—
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., 4,290,316, Cl. 74-5.460.
Polaroid Corporation: *See*—
Bagdis, Judy, 4,290,683, Cl. 354-234.000.
Cincotta, Louis; and Foley, James W., 4,290,955, Cl. 260-336.000.
Cournoyer, Richard L.; and Foley, James W., 4,290,950, Cl. 260-326.12R.
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,290,951, Cl. 260-326.12R.
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Polozov, Boris V.: *See*—
Syrov, Anatoly A.; Ivanchev, Sergei S.; Primachenko, Oleg N.; Demidova, Valentina A.; Polozov, Boris V.; Fionov, Vladimir I.; and Barantsevich, Evgeny N., 4,290,945, Cl. 260-192.000.
Pomerantz, Allen J., to General Motors Corporation. Closed loop fuel control system for an internal combustion engine. 4,290,400, Cl. 123-440.000.
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Poper, Maxwell H.; and Jungermann, Eric, to Neutrogena Corporation. Transparent soap. 4,290,904, Cl. 252-118.000.
Port-A-Lock Incorporated: *See*—
McKenzie, Kenneth B., 4,290,635, Cl. 292-290.000.
Porter, Kenneth, to Imperial Chemical Industries Limited. Machine for producing stitch bonded fabric. 4,290,278, Cl. 66-84.00A.
Portmann, Hubert, to Ebauches SA. Device for charging an accumulator from an electrical energy source more particularly for an electronic watch. 4,291,266, Cl. 320-2.000.
Ports, Kenneth A.; and Lucas, William G., to Harris Corporation. Method of fabricating surface contacts for buried layer into dielectric isolated islands. 4,290,831, Cl. 148-187.000.
Possati, Mario, to Finike Italiana Marposs, S.p.A. Plug gauge for checking internal geometric dimensions. 4,290,204, Cl. 33-178.00E.
Poulos, Andrew C.; and Thibodeau, Michael J., to American Cyanamid Company. Settling out suspended solids in phosphoric acid product solutions. 4,291,005, Cl. 423-321.00R.
Pourmand, Bahram: *See*—
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Power, Joseph K.: *See*—
Hopkins, Harry C.; Goethert, Bernhard H.; and Power, Joseph K., 4,290,500, Cl. 180-117.000.
Powers, Robert W.: *See*—
DeCarlo, Vincent J.; Powers, Robert W.; and Mitoff, Stephan P., 4,291,108, Cl. 429-193.000.
Pozin, Mikhail A.; and Serkh, Mikhail B. Apparatus for continuous temperature measurement of the dew point of flue gases. 4,290,299, Cl. 73-17.00A.
PPG Industries Canada Ltd.: *See*—
Thompson, Robert E., 4,290,650, Cl. 299-4.000.
PPG Industries, Inc.: *See*—
Reese, Thomas J.; and Fisher, Joseph J., 4,290,796, Cl. 65-287.000.
Pratt, Allan F.: *See*—
Spiller, Basil H. R.; and Pratt, Allan F., 4,291,309, Cl. 343-7.500.
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Price, Garey W. Static electricity grounding comb. 4,290,438, Cl. 132-11.00R.
Price, Larry V.: *See*—
Scott, Douglas R.; and Price, Larry V., 4,290,441, Cl. 137-84.000.
Price, Samuel T.; and Hoffsommer, Kay P., to Enterprise Machine and Development Corp. Air jet with a baffle including an arcuate yarn engaging surface. 4,290,177, Cl. 28-254.000.
Prikkel, John, III. Damper control mechanism. 4,290,552, Cl. 236-1.00G.
Primachenko, Oleg N.: *See*—
Syrov, Anatoly A.; Ivanchev, Sergei S.; Primachenko, Oleg N.; Demidova, Valentina A.; Polozov, Boris V.; Fionov, Vladimir I.; and Barantsevich, Evgeny N., 4,290,945, Cl. 260-192.000.
Procter & Gamble Company, The: *See*—
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Macgilp, Neil A.; and Mann, Duncan A., 4,290,903, Cl. 252-91.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Strassel, Albert, 4,291,099, Cl. 428-421.000.
Proebsting, Robert J., to Mostek Corporation. Timing of active pullup for dynamic semiconductor memory. 4,291,392, Cl. 365-203.000.
Propst, Robert L.; and Raftery, William B., to Herman Miller, Inc. Stacking pallet. 4,290,369, Cl. 108-53.300.
Provine, Daniel J., to Westinghouse Electric Corp. Non-linear raster generator. 4,291,308, Cl. 343-5.0SC.
Puleo, Salvatore J. Bracket for artificial Christmas tree branches. 4,291,075, Cl. 428-8.000.
Pullman Incorporated: *See*—
Coccia, Larry A., 4,290,587, Cl. 266-191.000.
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Brewer, Thomas D.; Purcell, Robert J.; and Sturges, James R., 4,290,236, Cl. 51-5.00A.
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Barrett, John H.; and Flynn, Brian P., 4,291,072, Cl. 427-243.000.
Purification Sciences, Inc.: *See*—
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Quant, Tony, to Canadian General Electric Company Limited. Remote control wiring system. 4,291,360, Cl. 361-189.000.
Quargentan, Ernesto: *See*—
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Quine, John P., to General Electric Company. Planar microwave integrated circuit power combiner. 4,291,278, Cl. 330-286.000.
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Quinton, Christian: *See*—
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R. F. B. Engineering Inc.: *See*—
Ferreira, Roberto J., 4,290,720, Cl. 409-233.000.
Rabedeaux, Richard W. Multi systems solar collector. 4,290,419, Cl. 126-450.000.
Rae, Andrew E. Combination lock. 4,290,286, Cl. 70-285.000.
Raftery, William B.: *See*—
Propst, Robert L.; and Raftery, William B., 4,290,369, Cl. 108-53.300.
Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Diverter means for flexible disk pack and associated method. 4,291,349, Cl. 360-98.000.
Rainbolt, Michael A., to Rainbolt Research, Inc. Electric motor. 4,291,248, Cl. 310-14.000.
Rainbolt Research, Inc.: *See*—
Rainbolt, Michael A., 4,291,248, Cl. 310-14.000.
Ralston, Richard W.: *See*—
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,291,390, Cl. 365-183.000.

Rao, Basrur R.; Ross, Gerald F.; and Cronson, Harry M., to Sperry Corporation. Shielded surface wave transmission line. 4,291,289, Cl. 333-240.000.

Rapstein, Kirby T.: *See—*
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Raschke, Curt R.: *See—*
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Ratcliffe, Ronald W.: *See—*
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzman, Thomas N., 4,290,947, Cl. 260-239.00A.

Rau, Manfred C., to P C U K Produits Chimiques Ugine Kuhlmann. Process for the coloration of hydrophobic fibers. 4,290,770, Cl. 8-662.000.

Rawicki, Bogdan J. Apparatus and method for extracting dust from air. 4,290,784, Cl. 55-95.000.

Rawson, Darwin B. Oar lock seat. 4,290,156, Cl. 9-1.100.

Ray, Ranjan, to Allied Chemical Corporation. Metallic glass powders from glassy alloys. 4,290,808, Cl. 75-251.000.

Raychem Corporation: *See—*
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RCA Corporation: *See—*
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Bohringer, Walter, 4,291,257, Cl. 315-408.000.
Henderson, John G. N.; and Maturo, Robert J., 4,291,413, Cl. 455-164.000.
Kessler, Sebastian W., Jr.; and Olmstead, John A., 4,291,324, Cl. 357-36.000.
Nossen, Edward J., 4,291,269, Cl. 324-79.00D.
Nossen, Edward J., 4,291,275, Cl. 329-112.000.
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Shanley, Robert L., II, 4,291,336, Cl. 358-160.000.
Weimer, Paul K., 4,291,239, Cl. 307-221.00D.

Reavill, Joseph A.; and Arachi, John M., to General Dynamics, Pomona Division. Method for vacuum lamination of flex circuits. 4,290,838, Cl. 156-286.000.

Rebman, Jack, to Lord Corporation. Insertion compliance device. 4,290,203, Cl. 33-169.00C.

Reed, David E.: *See—*
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Reel-O-Matic Systems, Incorporated: *See—*
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Reese, Thomas J.; and Fisher, Joseph J., to PPG Industries, Inc. Mold alignment means for glass sheet shaping apparatus. 4,290,796, Cl. 65-287.000.

Regalbuto, John A., to Jet Research Center, Inc. Methods and apparatus for severing conduits. 4,290,486, Cl. 166-297.000.

Regel, Walter: *See—*
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Regie Nationale des Usines Renault: *See—*
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Reichenecker, William J.: *See—*
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Reidies, Arno H.: *See—*
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Reilly, Thomas: *See—*
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Reina, Erminia, to Alucaps Italiana S.p.A. Sealing bung for bottle closures. 4,290,535, Cl. 215-270.000.

Reinehr, Dieter; and Lienhard, Paul, to Ciba-Geigy Corporation. Undecanoic acids and esters thereof. 4,290,964, Cl. 260-404.000.

Reinhold, Detlef: *See—*
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Reinke, William L.; and Stearley, John W., to Eaton Corporation. Removable push-to-unlock actuator for locking pivoted-subactuator self-enclosed electric switch. 4,291,207, Cl. 200-42.00R.

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Reneau, Bobby J.: *See—*
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Repsher, Wendy J.; and Rapstein, Kirby T., to Dow Chemical Company, The. Recovery of lithium from brine. 4,291,001, Cl. 423-179.500.

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Malone, William H.; Fischley, John; Anderson, Harry L.; and Spirko, Edward J., 4,290,751, Cl. 432-214.000.

Research Corporation: *See—*
Nicolaou, Kyriacos C.; Barnette, William E.; and Magolda, Ronald L., 4,291,166, Cl. 549-51.000.
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Research Foundation of the City University of New York, The: *See—*
Alfano, Robert R.; and Green, Bruce H., 4,291,282, Cl. 331-94.50S.

Retzlaff, Wilfred F., to L. D. Schreiber Cheese Co., Inc. Method for making large sized blocks of cheese. 4,291,064, Cl. 426-397.000.

Reuland, Joachim, to Hauni-Werke Korber & Co. KG. Method and apparatus for producing an elongated filler from fibers, especially tobacco fibers. 4,290,436, Cl. 131-108.000.

Reynolds, Derek P., to Glaxo Group Limited. Cycloaliphatic compounds, analgesic compositions thereof and method of use thereof as analgesics. 4,291,059, Cl. 424-311.000.

Reynolds, Lawrence E. Support assembly. 4,290,532, Cl. 211-200.000.

Reynolds, Robert L.: *See—*
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Rez, Betty: *See—*
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Rhodes, Roland N.; Schroeder, Alfred C.; and Moles, Warren H., to RCA Corporation. Color encoding filter. 4,290,671, Cl. 350-317.000.

Rhodes, Ronald B., to Salgar Supplies Ltd. Conveyor belt cleaning device. 4,290,520, Cl. 198-499.000.

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Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,291,032, Cl. 424-248.510.
Ludec, Joel L., 4,291,178, Cl. 568-764.000.
Pigeon, Raymond, 4,290,869, Cl. 204-159.130.

Richards, Elmer A.: *See—*
Bogema, Edward J.; and Richards, Elmer A., 4,290,515, Cl. 192-53.00C.

Richards, Francis D.: *See—*
Chulay, Steven J.; and Richards, Francis D., 4,290,550, Cl. 233-26.000.

Richards, Janice M. B.: *See—*
Richards, Robert A., 4,290,198, Cl. 30-164.500.

Richards, Robert A., to Richards, Janice M. B., a part interest. Ice breaker. 4,290,198, Cl. 30-164.500.

Richardson-Merrell Inc.: *See—*
Harrison, Boyd L.; and Dolfini, Joseph E., 4,291,160, Cl. 544-17.000.

Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for explosively expanding a pillar for forming an in situ oil shale retort. 4,290,649, Cl. 299-2.000.

Ricoh Co., Ltd.: *See—*
Ikeda, Kunio; and Haga, Hirosi, 4,290,857, Cl. 204-9.000.
Kakeno, Sadao; Hayashi, Taisen; Komai, Hiromichi; and Yamazaki, Hiroshi, 4,291,316, Cl. 346-140.00R.
Nakajima, Yoshinori, 4,291,262, Cl. 318-603.000.
Ogawa, Mutsuo; Murayama, Noboru; Konishi, Akira; and Takeuchi, Norisada, 4,291,339, Cl. 358-260.000.

Riddle, Herbert S., Jr. Frequency-ratio apparatus. 4,291,343, Cl. 360-30.000.

Ridgway, John A., to Standard Oil Company (Indiana). Treatment of proteinaceous materials with anhydrous ammonia gas. 4,291,063, Cl. 426-319.000.

Rieger, Wolfhart: *See—*
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, 4,290,477, Cl. 164-430.000.

Riew, Changkiu K.: *See—*
Bertsch, Robert J.; and Riew, Changkiu K., 4,290,939, Cl. 260-40.00R.

Riker, Alton L. Hand tool. 4,290,327, Cl. 81-3.00R.

Rippere, Ralph E. Methods and articles for making electrical circuit connections employing composition material. 4,290,195, Cl. 29-837.000.

Rittman, Alan H.: *See—*
Fletcher, Robert L.; VanLandingham, Richard D.; Brown, Sheldon H.; and Rittman, Alan H., 4,291,353, Cl. 360-128.000.

Rizza, Michael C.: *See—*
Brown, Delmont D.; and Rizza, Michael C., 4,290,713, Cl. 404-69.000.

Robert Bosch GmbH: *See—*
Domke, Klaus; and Saur, Walter, 4,290,253, Cl. 53-410.000.
Muller, Horst; and Vorwerk, Helmut, 4,291,411, Cl. 455-88.000.

Roberts, Fred A. Surgical gown. 4,290,148, Cl. 2-51.000.

Roberts, Robert C.: *See—*
Ball, Russell M.; and Roberts, Robert C., 4,290,851, Cl. 176-24.000.

Roberts, Timothy P.: *See—*
Wehrli, Hans J.; and Roberts, Timothy P., 4,290,694, Cl. 356-2.000.

Robertshaw Controls Company: *See—*
Bauer, Werner R., 4,290,453, Cl. 137-625.430.
Scott, Douglas R.; and Price, Larry V., 4,290,441, Cl. 137-84.000.

Robinson, Charles E. Automatic equalizer for abrasive belt. 4,290,240, Cl. 51-135.0BT.

Rockwell International Corporation: *See—*
Caples, Edgar L.; Marston, Robert K.; and Massad, Khalil E., 4,291,410, Cl. 375-1.000.
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., 4,290,316, Cl. 74-5.460.
Waddill, John W.; and Pourmand, Bahram, 4,291,403, Cl. 371-5.000.
Wen, Cheng P.; Kuvas, Reidar L.; and Immorlica, Anthony A., Jr., 4,291,320, Cl. 357-13.000.

Rockwell-Rimoldi, S.p.A.: *See—*
Brusasca, Gianfranco; and Garzulano, Gianfranco, 4,290,376, Cl. 112-121.260.
Roessler, Helmut: *See—*
Muehlbauer, Otto; Bigall, Klaus D.; and Roessler, Helmut, 4,291,221, Cl. 235-92.0CC.
Rogers, Edward F.: *See—*
Brown, Jeannette E.; Rogers, Edward F.; and Graham, Donald W., 4,290,966, Cl. 260-413.000.
Rohm GmbH: *See—*
Pennewiss, Horst; Benda, Rainer; Jost, Heinz; and Knoell, Helmuth, 4,290,925, Cl. 252-56.00S.
Rohm and Haas Company: *See—*
Warburton, Charles E., Jr., 4,291,087, Cl. 428-288.000.
Rohner, Michel, to Singer Company, The. Resolvability test and projection size clipping for polygon face display. 4,291,380, Cl. 364-522.000.
Rohr Industries, Inc.: *See—*
Hom, Felix, 4,291,079, Cl. 428-116.000.
Rohte, Oskar: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,291,037, Cl. 424-253.000.
Roman, Walter C., to Ultimate Resources, Inc. Windrowing type composting apparatus. 4,290,703, Cl. 366-345.000.
Rosemount Inc.: *See—*
Geronime, Robert L., 4,290,314, Cl. 73-861.520.
Rosenberg, Avner. Sprinklers. 4,290,557, Cl. 239-222.210.
Rosenbloom, Percy, Jr.; and Rosenbloom, Percy, III, to Technical Materials, Inc. Portable collapsible container. 4,290,468, Cl. 150-49.000.
Rosenbloom, Percy, III: *See—*
Rosenbloom, Percy, Jr.; and Rosenbloom, Percy, III, 4,290,468, Cl. 150-49.000.
Rosler, Helmut, to Siemens Aktiengesellschaft. Two output clock for integrated semiconductor digital circuits. 4,291,240, Cl. 307-262.000.
Ross, Gerald F.: *See—*
Rao, Basrur R.; Ross, Gerald F.; and Cronson, Harry M., 4,291,289, Cl. 333-240.000.
Ross, Karl-Heinz; Dudeck, Christian; Himmele, Walter; Lebkuecher, Rolf; and Sauer, Wolfgang, to BASF Aktiengesellschaft. Preparation of 2,5-dimethyl-4-hydroxy-2,3-dihydrofuran-3-one. 4,290,960, Cl. 260-348.570.
Rossi, Anthony T., to Tropicana Products, Inc. Apparatus for dispensing and submersing batch materials in a molten glass furnace. 4,290,797, Cl. 65-335.000.
Rossmann, Axel: *See—*
Betz, Wolfgang; and Rossmann, Axel, 4,290,845, Cl. 156-644.000.
Roswog, Edward J.: *See—*
Charlebois, Thomas F.; and Roswog, Edward J., 4,290,309, Cl. 73-621.000.
Rotolante, Ralph A.; and Koehler, Toivo, to Carson Alexiou Corporation. Focal plane photo-detector mosaic array fabrication. 4,290,844, Cl. 156-630.000.
Rousemount Inc.: *See—*
Anderson, Loren A., 4,290,297, Cl. 73-1.00R.
Roussel Uclaf: *See—*
Barnes, Alan C.; and Kay, David P., 4,291,033, Cl. 424-250.000.
Farcilli, Andre; Medici, Italo; Fournex, Robert; and Barzaghi, Fernando, 4,291,038, Cl. 424-256.000.
Royle, Rae A., to Texaco Inc. Demulsifier for inclusion in injected acidization systems for petroleum formation stimulation. 4,290,901, Cl. 252-8.55C.
Rubin, Charles P.: *See—*
Smolik, John V.; Swanson, Ronald V.; Rubin, Charles P.; Blaschke, James C.; and Wagner, Roger J., 4,290,570, Cl. 244-158.00R.
Rudel, Reinhard. Joint for an observation device. 4,290,666, Cl. 350-85.000.
Rudnitsky, Valery A.: *See—*
Lukhvich, Alexandr A.; Rudnitsky, Valery A.; Linnik, Ivan I.; and Gavris, Genrikh B., 4,291,270, Cl. 324-230.000.
Rueggeberg, Werner, to Armstrong Cork Company. Corona discharge electrode system. 4,291,226, Cl. 250-324.000.
Ruger, William B., to Sturm, Ruger & Co., Inc. Lightweight stock and frame construction for a firearm. 4,290,220, Cl. 42-75.00D.
Ruhe, Anthony; and Adams, Peter J., to Foster Wheeler Limited. Vapor generator. 4,290,388, Cl. 122-235.00A.
Rupp, Thomas F.; and Wells, Lowell J., to Owens-Illinois, Inc. Ceramic decorated glassware. 4,290,533, Cl. 215-1.00R.
Russell, George F. Solar energy collector sun-tracking apparatus and method. 4,290,411, Cl. 126-425.000.
Rust-Oleum Corporation: *See—*
Brown, Kenneth H.; and Wolma, Kenneth M., 4,290,811, Cl. 106-1.170.
Ruti Machinery Works Ltd.: *See—*
Steiner, Alois, 4,290,458, Cl. 139-28.000.
Ruti-Te Strake B.V.: *See—*
Manders, Petrus G. J., 4,290,459, Cl. 139-435.000.
Rysti, Alpo; Anttila, Seppo; and Maki-Hoimela, Veijo, to Rysti, Alpo. Method for using timber sorting compartments and a sorting compartment for said method. 4,290,722, Cl. 414-48.000.
S. J. Electro Systems, Inc.: *See—*
Johnston, Stephen P., 4,291,261, Cl. 318-482.000.
S/V Tool Company, Inc.: *See—*
Fee, Robert W.; TenEyck, Richard E.; and Smith, Lloyd T., 4,290,465, Cl. 145-61.00R.
Saga Petroleum A.S. & Co.: *See—*
Seabourn, Ed. O.; Patterson, Lewis W.; and Stiverson, Richard G., 4,290,759, Cl. 434-370.000.
Sagane, Yasuo: *See—*
Miyauchi, Seiroku; Sagane, Yasuo; and Irie, Kazuo, 4,290,641, Cl. 296-146.000.
Sagemuller, Albert: *See—*
Kockerols, Erhard; and Sagemuller, Albert, 4,290,153, Cl. 4-491.000.
Sagou, Masakazu: *See—*
Yasui, Seimei; Sagou, Masakazu; Noguchi, Takanobu; Toyoshima, Yoshiki; and Saito, Junzo, 4,291,148, Cl. 528-142.000.
Sahara, Masayoshi: *See—*
Kobori, Toshio; and Sahara, Masayoshi, 4,290,674, Cl. 354-38.000.
Saint Gobain Industries: *See—*
Grassin, Jerome; Thouvenin, Maurice; and Epie, Jean-Claude, 4,290,544, Cl. 228-7.000.
Saito, Hiromitsu: *See—*
Hirata, Tadashi; Ogasa, Takehiro; Saito, Hiromitsu; and Nakmizo, Nobuhiro, 4,291,164, Cl. 546-183.000.
Saito, Junichi: *See—*
Kishino, Shigeo; Saito, Junichi; Kume, Toyohiko; and Isono, Kunihiro, 4,290,978, Cl. 260-973.000.
Saito, Junzo: *See—*
Yasui, Seimei; Sagou, Masakazu; Noguchi, Takanobu; Toyoshima, Yoshiki; and Saito, Junzo, 4,291,148, Cl. 528-142.000.
Saito, Kenzo, to Sony Corporation. Tape cassette brake assembly. 4,290,567, Cl. 242-198.000.
Saito, Shozo: *See—*
Saito, Takashi; Ohwada, Masataka; and Saito, Shozo, 4,290,906, Cl. 252-301.10W.
Saito, Syuichiro; Uchiyama, Takashi; and Yoshida, Syozo, to Canon Kabushiki Kaisha. Electromagnetically operated shutter. 4,290,682, Cl. 354-234.000.
Saito, Takashi; Ohwada, Masataka; and Saito, Shozo, to Hitachi, Ltd. Apparatus for cutting channel box for fuel assembly and method therefor. 4,290,906, Cl. 252-301.10W.
Saito, Tetsu: *See—*
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.
Sajewski, Vincent F.: *See—*
Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., 4,290,627, Cl. 280-729.000.
Sakai, Shinji: *See—*
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,290,686, Cl. 354-289.000.
Sakai, Yoshihiro: *See—*
Kawakubo, Mitsushige; Sakai, Yoshihiro; and Ohno, Akira, 4,290,288, Cl. 72-7.000.
Sakaida, Akira: *See—*
Koshiishi, Hiromichi; Mori, Kunio; Sato, Hiroshi; and Sakaida, Akira, 4,290,829, Cl. 148-130.000.
Sakamoto, Junichi: *See—*
Miyake, Hideo; Sakamoto, Junichi; Sawaki, Masakazu; and Hara, Mamoru, 4,290,938, Cl. 260-40.00R.
Sakamoto, Keiji: *See—*
Kawada, Shigeki; Ishida, Hiroshi; and Sakamoto, Keiji, 4,291,265, Cl. 318-782.000.
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Distance detecting device. 4,291,223, Cl. 250-201.000.
Sakano, Kenji; Yamashita, Masahiro; Yamashita, Kenji; and Aketa, Masahiro, to Kubota Ltd. Balancing device for an engine. 4,290,395, Cl. 123-192.00B.
Sakashita, Masao, to Kabushiki Kaisha Kawai Gakki Seisakusho. Expression means of electronic musical instrument. 4,290,333, Cl. 84-1.240.
Salemi, Nicholas A.: *See—*
Seidling, Eugene H.; and Salemi, Nicholas A., 4,291,209, Cl. 200-153.00G.
Salgar Supplies Ltd.: *See—*
Rhodes, Ronald B., 4,290,520, Cl. 198-499.000.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Ski-boot enabling its deliberate release from the ski by means of the ski-stick. 4,290,213, Cl. 36-117.000.
Salzman, Thomas N.: *See—*
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzman, Thomas N., 4,290,947, Cl. 260-239.00A.
Sama, Nicholas. Classifying device for aggregates immersed in a fluid. 4,290,883, Cl. 210-169.000.
Samputensili S.p.A.: *See—*
Occhialini, Carlo, 4,290,718, Cl. 409-8.000.
Sandler, Stanley R., to Pennwalt Corporation. Polyoxyalkylene polycarboxylate esters and a method of treating polyester fabric. 4,290,765, Cl. 8-115.600.
Sandoz Ltd.: *See—*
Nougaret, Jean-Pierre, 4,291,016, Cl. 424-35.000.
Sandrin, Edmond; and Bauer, Wilfried, 4,291,022, Cl. 424-177.000.
Sandrin, Edmond; and Bauer, Wilfried, to Sandoz Ltd. Organic compounds. 4,291,022, Cl. 424-177.000.
Sangamo-Weston, Inc.: *See—*
Patton, Charles C., 4,291,236, Cl. 307-40.000.

Sankyo Electric Company Limited: *See*—
Hiraga, Masaharu; and Kimura, Seishi, 4,290,345, Cl. 92-79.000.
Sano, Isao: *See*—
Oeda, Ichiro; and Sano, Isao, 4,291,018, Cl. 424-64.000.
Sansregret, Joseph L., to Exxon Research & Engineering Co. Amorphous silicon MIS device. 4,291,318, Cl. 357-2.000.
Santalucia, Pietro: *See*—
Disco, Paulus J.; Quargentan, Ernesto; and Santalucia, Pietro, 4,290,275, Cl. 62-238.600.
Sargent & Greenleaf, Inc.: *See*—
Peppard, James P., 4,290,287, Cl. 70-355.000.
Sarosi, Lajos: *See*—
Torok, Gabor; Sarosi, Lajos; Grof, Ferenc; Becsei, Tamas; and Barta, Peter, 4,290,894, Cl. 210-661.000.
Sasabe, Yukiyoshi: *See*—
Ookubo, Takashi; and Sasabe, Yukiyoshi, 4,290,318, Cl. 74-477.000.
Sasahara, Kazuo: *See*—
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.
Sasaki, Ichiro: *See*—
Sasaki, Yoshikazu; Inoue, Hiroshi; Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,290,936, Cl. 260-33.40P.
Sasaki, Isao: *See*—
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, 4,291,097, Cl. 428-412.000.
Sasaki, Jun: *See*—
Minamizono, Junji; Yoneyama, Masakazu; and Sasaki, Jun, 4,291,113, Cl. 430-202.000.
Sasaki, Keiichi: *See*—
Uesugi, Nobuo; Miyazawa, Tatsuo; Furudate, Mituaki; Sasaki, Keiichi; and Mizuguchi, Hiroji, 4,290,849, Cl. 176-19.00R.
Sasaki, Shigeo; and Yamamoto, Osamu, to Hitachi Maxell, Ltd. Hub for use in a magnetic recording tape cassette. 4,290,562, Cl. 242-74.000.
Sasaki, Tohru; Terasaki, Syuuzi; and Susa, Tomoo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Piezoelectric and pyroelectric film and method for preparing the film. 4,290,983, Cl. 264-22.000.
Sasaki, Yoshikazu; Inoue, Hiroshi; Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, to UBE Industries, Ltd. Process for preparing polyimide solution. 4,290,936, Cl. 260-33.40P.
Sato, Hideo; and Yagi, Toshio, to Mitsubishi Petrochemical Co., Ltd. Production of modified polypropylenes. 4,291,138, Cl. 525-247.000.
Sato, Hideo: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.
Sato, Hiroshi: *See*—
Koshiishi, Hiromichi; Mori, Kunio; Sato, Hiroshi; and Sakaida, Akira, 4,290,829, Cl. 148-130.000.
Sato, Shimio: *See*—
Morita, Minoru; Sato, Shimio; Hashimoto, Takao; and Kitaoka, Yoji, 4,290,999, Cl. 422-194.000.
Sato, Shitomi, to Kubota, Ltd. Furnace door having sealing structure for sealing between furnace door and furnace frame. 4,290,372, Cl. 110-173.00R.
Sato, Takao: *See*—
Omori, Takashi; and Sato, Takao, 4,290,850, Cl. 176-20.00R.
Satoi, Shuzo: *See*—
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.
Satzinger, Roland, to Gebhardt Satzinger Metallwarenfabrik. Reel for the unreeling of tapes or the like. 4,290,561, Cl. 242-55.000.
Sauer, Wolfgang: *See*—
Ross, Karl-Heinz; Dudeck, Christian; Himmele, Walter; Lebkuecher, Rolf; and Sauer, Wolfgang, 4,290,960, Cl. 260-348.570.
Saunders, Frank L., to Dow Chemical Company, The. Process of making thermoset foams of acrylic polymers. 4,291,130, Cl. 521-136.000.
Saunders, Ian J.: *See*—
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., 4,290,825, Cl. 148-33.400.
Saur, Walter: *See*—
Domke, Klaus; and Saur, Walter, 4,290,253, Cl. 53-410.000.
Saurer-Diederichs: *See*—
Deborde, Albert H., 4,290,460, Cl. 139-435.000.
Saviano, Francesco: *See*—
Pagani, Giorgio; Lagana, Vincenzo; and Saviano, Francesco, 4,291,006, Cl. 423-359.000.
Sawada, Daisaku: *See*—
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.
Sawada, Jiro: *See*—
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, 4,290,962, Cl. 260-397.450.
Sawaki, Masakazu: *See*—
Miyake, Hideo; Sakamoto, Junichi; Sawaki, Masakazu; and Hara, Mamoru, 4,290,938, Cl. 260-40.00R.
Sayo, Kosaku: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Tohkairin, Akira; and Sayo, Kosaku, 4,290,295, Cl. 72-356.000.
Scales, Walter C.: *See*—
Weinberg, Aaron; Ebert, Paul M.; Fee, Joseph J.; Kaminsky, Yaroslav; Keblawi, Feisal S.; and Scales, Walter C., 4,291,409, Cl. 375-1.000.
Scandinavian Ski Shop Limited: *See*—
Luomaranta, Mauri, 4,290,499, Cl. 177-48.000.
Schaafsma, Sijbrandus E.; Hofman, Johannes H. A.; and Claassens, Johannes E. L., to Stamicarbon, B.V. Preparation of delta-ketoesters. 4,291,170, Cl. 560-126.000.
Schad, Robert D., to Husky Injection Molding Systems Inc. Injection-molding machine with reciprocating plasticizing screw. 4,290,701, Cl. 366-77.000.
Schajer, Gary S.: *See*—
Barry, Thomas I.; Schajer, Gary S.; and Stackpool, Francis M., 4,291,107, Cl. 429-104.000.
Scharer, Hans R.; Antrim, Richard D.; and Strang, John R., to USM Corporation. Adjustable pelletizing apparatus. 4,290,742, Cl. 425-313.000.
Scheibengraber, Karl J. Rotary engine. 4,290,341, Cl. 91-339.000.
Schenck, Hans-Uwe: *See*—
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,291,147, Cl. 528-119.000.
Schering Aktiengesellschaft: *See*—
Schulze, Paul-Eberhard; and Kerb, Ulrich, 4,290,963, Cl. 260-397.450.
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Prezewowsky, Klaus; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,291,029, Cl. 424-238.000.
Schermer, Heinz: *See*—
Luhrsen, Ernst; and Schermer, Heinz, 4,290,589, Cl. 266-236.000.
Schickel, Eberhard: *See*—
Strecker, Helmut; Molter, Michael; Kloss, Gerhard; and Schickel, Eberhard, 4,291,012, Cl. 424-1.000.
Schirk, Karl-Heinz: *See*—
Eckstein, Wolfgang; Schirk, Karl-Heinz; and Reinhold, Detlef, 4,290,792, Cl. 55-480.000.
Schiweck, Hubert: *See*—
Huber, Herbert; and Schiweck, Hubert, 4,290,818, Cl. 127-52.000.
Schleffendorf, John J. Physical exercise apparatus. 4,290,597, Cl. 272-117.000.
Schlegel Corporation: *See*—
Mass, Ronald H., 4,290,249, Cl. 52-396.000.
Schlegel, Earl S.: *See*—
Hanes, Maurice H.; and Schlegel, Earl S., 4,291,329, Cl. 357-64.000.
Schlossfabrik Schulte & Co.: *See*—
Tremp, Walter, 4,290,571, Cl. 248-59.000.
Schlumberger Technology Corporation: *See*—
Bonnet, Jean L., 4,291,267, Cl. 324-54.000.
Schmidt, Carolyn E.: *See*—
Jayant, Nuggehally S.; Schmidt, Carolyn E.; and Steele, Raymond, 4,291,405, Cl. 371-31.000.
Schmidt, John, to Minigrip, Inc. Reclosable film plastic bags and method of making same. 4,290,467, Cl. 150-3.000.
Schmidt, Lewis W.; Bettencourt, Darryl G.; Dietz, Charles F.; and Marshall, George E., Jr., to Blackwelders. Refuse bin lid unit. 4,290,352, Cl. 100-100.000.
Schmitt, Harold W., to Environmental Systems Corporation. Method and apparatus for measurement of transmittance and scatter of light in water. 4,290,695, Cl. 356-73.000.
Schnaebele, Werner: *See*—
Weidenhagen, Dieter; and Schnaebele, Werner, 4,290,364, Cl. 102-384.000.
Schneider, Gernot; and Steinle, Benedikt, to LGZ Landis & Gyr Zug AG. Apparatus for measuring electrical power. 4,291,377, Cl. 364-483.000.
Schneider, Rainer; and Abeler, Gerd, to Ciba-Geigy Corporation. Heat-stabilized chlorine-containing thermoplastic. 4,290,942, Cl. 260-45.85H.
Schoeffling, Thomas I., Jr. Sound shielding and pick-up device. 4,290,332, Cl. 84-1.140.
Schoen, Bernd-Jurgen: *See*—
Bruckner, Georg F.; Geike, Bernd; Berger, Fritz; and Schoen, Bernd-Jurgen, 4,290,147, Cl. 2-18.000.
Schoeps, Bernard; and Foret, Michel, to Laminoirs de Strasbourg. Process for producing a sheet or strip which is lightly galvanized on one or both sides and products obtained by said process. 4,291,074, Cl. 427-367.000.
Schopper, Heinrich-Christian: *See*—
Schroeder, Gerhard; Buxbaum, Gunter; Hund, Franz; Schopper, Heinrich-Christian; and Naumann, Rolf, 4,290,799, Cl. 75-0.50A.
Schott, Lawrence A.; and Schott, Roger A. Lubricating apparatus and system. 4,290,462, Cl. 141-98.000.
Schott, Roger A.: *See*—
Schott, Lawrence A.; and Schott, Roger A., 4,290,462, Cl. 141-98.000.
Schramm, Arno. Exchanger element for bottoms in material exchanger columns. 4,290,981, Cl. 261-114.0VT.
Schreck, Carl E.: *See*—
McGovern, Terrence P.; and Schreck, Carl E., 4,291,041, Cl. 424-267.000.
Schriber, Gene A., to Motorola, Inc. Driver circuit for use in an output buffer. 4,291,242, Cl. 307-270.000.
Schroeder, Alfred C.: *See*—
Rhodes, Roland N.; Schroeder, Alfred C.; and Moles, Warren H., 4,290,671, Cl. 350-317.000.

Schroeder Brothers Corporation: *See*—
Barthe, Henry P.; and Cobb, William R., 4,290,490, Cl. 173-23.000.

Schroeder, Gerhard; Buxbaum, Gunter; Hund, Franz; Schopper, Heinrich-Christian; and Naumann, Rolf, to Bayer Aktiengesellschaft. Ferromagnetic metal pigment essentially consisting of iron and a process for its production. 4,290,799, Cl. 75-0.50A.

Schuff, Richard W., to Ecotech Corporation. Apparatus for removing particulate matter from a gas stream. 4,290,786, Cl. 55-107.000.

Schulze, Paul-Eberhard; and Kerb, Ulrich, to Schering Aktiengesellschaft. Process for preparing $\Delta^{9(11)}$ and/or Δ^{16}-unsaturated sternoids. 4,290,963, Cl. 260-397.450.

Schupp, Eberhard: *See*—
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,291,147, Cl. 528-119.000.

Schwabe, William E.: *See*—
Elsner, Ernst; Kasper, Rudolf; and Schwabe, William E., 4,291,190, Cl. 13-18.00R.

Schwerdtfeger, Joachim: *See*—
Sensis, Siegfried; Schwerdtfeger, Joachim; Walden, Klaus; and Ameling, Dieter, 4,290,800, Cl. 75-12.000.

Schworer, Artur, to Peri-Werk Artur Schworer KG. Climbing scaffolding. 4,290,576, Cl. 249-20.000.

Scientific Process & Research, Inc.: *See*—
Klein, Reuben; and Klein, Imrich, 4,290,702, Cl. 366-77.000.

Scott, Donald N.: *See*—
Stemler, Gary E.; and Scott, Donald N., 4,291,193, Cl. 174-11.00R.

Scott, Douglas R.; and Price, Larry V., to RobertShaw Controls Company. Control device and method of making the same. 4,290,441, Cl. 137-84.000.

Scott, Edward S. Dental post and method of installing. 4,290,755, Cl. 433-173.000.

Scott, Peter A. J., to Associated Engineering Limited. Positive clearance radial face seals. 4,290,613, Cl. 277-96.100.

Scott & Williams, Incorporated: *See*—
Valliere, Robert, 4,290,277, Cl. 66-24.000.

Scribner, Albert W. Control system for pneumatic punch press feeders. 4,290,541, Cl. 226-150.000.

Sea Solar Power: *See*—
Anderson, J. Hilbert, 4,290,631, Cl. 285-137.00A.

Seabourn, Ed. O.; Patterson, Lewis W.; and Stiverson, Richard G., to Saga Petroleum A.S. & Co. Apparatus for teaching pressure control in oil and gas drilling operations. 4,290,759, Cl. 434-370.000.

Seaman Corporation: *See*—
Mellin, Gerald D., 4,290,243, Cl. 52-63.000.

Sebag, Henri; and Vanlerberghe, Guy, to L'Oreal. Tensio-active polypod compounds, process for preparing them and compositions containing them. 4,290,956, Cl. 260-338.000.

Sedy, Josef, to Crane Packing Co. High pressure upstream pumping seal combination. 4,290,611, Cl. 277-27.000.

Sefton, Verner B.: *See*—
Bolton, Gerald L.; Sefton, Verner B.; and Zubryckyj, Nicolaus, 4,290,866, Cl. 204-119.000.

Segal, Leon, to Allied Chemical Corporation. Warp-free multi-layer stampable thermoplastic sheets. 4,291,084, Cl. 428-212.000.

Seidling, Eugene H.; and Salemi, Nicholas A., to Westinghouse Electric Corp. Circuit breaker having improved movable contact-drive mechanism interconnection. 4,291,209, Cl. 200-153.00G.

Seifers, Monte G. Engine disabling. 4,291,296, Cl. 340-64.000.

Seifert, Lester H. Single cable control system for lawn mower. 4,290,256, Cl. 56-11.300.

Seiler, Alfred J. Pump/exchanger device. 4,290,446, Cl. 137-557.000.

Seki, Shigeo: *See*—
Yoneta, Toshio; Shibahara, Seiji; Seki, Shigeo; and Fukatsu, Shunzo, 4,290,972, Cl. 260-465.00B.

Selbeck, Harald: *See*—
Hucks. Uwe; Wulff, Claus; Tresper, Erhard; Vernaleken, Hugo; and Selbeck, Harald, 4,290,977, Cl. 260-973.000.

Seldin, Emanuel J.; and Weng, Tu-Lung, to Union Carbide Corporation. High taper angle connecting pin for graphite electrode joints. 4,290,709, Cl. 403-296.000.

Selines, Ronald J., to Union Carbide Corporation. Method for deep drawing. 4,290,293, Cl. 72-342.000.

Sellers, Wm. Ralph. Dental twist-lock pin and drill. 4,290,756, Cl. 433-225.000.

Senco Products, Inc.: *See*—
Smith, James E.; and Baker, Gordon P., 4,290,493, Cl. 173-124.000.

Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, to Titan Kogyo Kabushiki Kaisha. Heat stable yellow iron oxides. 4,291,010, Cl. 423-594.000.

Sensis, Siegfried; Schwerdtfeger, Joachim; Walden, Klaus; and Ameling, Dieter, to Hamburger Stahlwerke GmbH. Process for feeding iron sponge into an electric arc furnace. 4,290,800, Cl. 75-12.000.

Sera, Hidefumi: *See*—
Kobayashi, Tomoyuki; Usami, Toshimasa; Misu, Hiroshi; and Sera, Hidefumi, 4,291,120, Cl. 430-531.000.

Serkh, Mikhail B.: *See*—
Pozin, Mikhail A.; and Serkh, Mikhail B., 4,290,299, Cl. 73-17.00A.

Severson, Asbjorn M., to Honeywell Inc. System for in situ meter testing. 4,290,298, Cl. 73-3.000.

Shaffer, Detmer B., to Sparkle Wash, Inc. Mobile cleaning unit. 4,290,442, Cl. 137-112.000.

Shanley, Robert L., II, to RCA Corporation. Composite keying signal generator for a television receiver. 4,291,336, Cl. 358-160.000.

Shapiro, Henry, to Maryland Cup Corporation. Two-piece paper cup for holding ice cream cones and the like. 4,290,573, Cl. 248-152.000.

Sharp, John. Solar heating collectors. 4,290,414, Cl. 126-429.000.

Sharp Kabushiki Kaisha: *See*—
Imai, Shigeki; and Fukuda, Hiroaki, 4,291,399, Cl. 368-82.000.

Sharp, Shelby P.; and Yarborough, Lyman, to Standard Oil Company (Indiana). Method and composition for removing elemental sulfur from high temperature, high pressure wells and flow lines. 4,290,900, Cl. 252-8.55B.

Shatz, Kenneth J.: *See*—
Cardone, Joseph T.; and Shatz, Kenneth J., 4,291,232, Cl. 290-1.00R.

Shavelzon, Lev A.: *See*—
Krasnov, Valery A.; Klovsky, Yakov A.; Dubov, Igor V.; Shtern, Arkady V.; Vyatkin, Viktor L.; and Shavelzon, Lev A., 4,290,665, Cl. 339-276.00T.

Shaw, Anthony R.: *See*—
Goodman, Ronald D.; Krueger, Wallace F.; and Shaw, Anthony R., 4,290,413, Cl. 126-426.000.

Shaw, David G., to General Electric Company. Non-halogenated impregnant for capacitors comprising an aromatic carboxylic acid ester and an alkene. 4,290,926, Cl. 252-579.000.

Shell Oil Company: *See*—
Dautzenberg, Frits M.; and Wagstaff, Nigel, 4,291,182, Cl. 585-415.000.
Wagstaff, Nigel, 4,291,188, Cl. 585-752.000.

Sherritt Gordon Mines Limited: *See*—
Adamovic, Emilija, 4,291,089, Cl. 428-325.000.
Bolton, Gerald L.; Sefton, Verner B.; and Zubryckyj, Nicolaus, 4,290,866, Cl. 204-119.000.
Clegg, Maurice A., 4,290,826, Cl. 148-101.000.

Shetler, Earl B. Back flow valve. 4,290,454, Cl. 137-853.000.

Shibahara, Seiji: *See*—
Yoneta, Toshio; Shibahara, Seiji; Seki, Shigeo; and Fukatsu, Shunzo, 4,290,972, Cl. 260-465.00B.

Shibuya, Yasutaka: *See*—
Kodama, Kazuyuki; Okada, Kunihiro; Huno, Takakazu; Endo, Takeyuki; and Shibuya, Yasutaka, 4,291,306, Cl. 340-744.000.

Shigematu, Takashi: *See*—
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.

Shimada, Keizo: *See*—
Tamura, Yorikazu; Aoki, Akihiro; and Shimada, Keizo, 4,291,142, Cl. 525-420.000.

Shimada, Shoji: *See*—
Kuwata, Takeo; Shimada, Shoji; and Usa, Mikio, 4,290,337, Cl. 411-2.000.

Shimamura, Juky, to Asahi Communications Inc. Torque transmission system for motor driven toy. 4,290,227, Cl. 46-206.000.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi; and Someya, Itsuo, 4,290,506, Cl. 188-24.190.

Shimizu, Toshio: *See*—
Takahashi, Yasunobu; Fujimoto, Einosuke; Shimizu, Toshio; and Kato, Takeo, 4,290,946, Cl. 260-239.00B.

Shin-Etsu Chemical Co., Ltd.: *See*—
Takago, Toshio, 4,291,144, Cl. 528-26.000.

Shinmura, Nobuyuki: *See*—
Komatsu, Kazurou; Matsumoto, Sojiro; Maniwa, Takeshi; and Shinmura, Nobuyuki, 4,290,969, Cl. 260-453.0AB.

Shirakawa, Takashi, to Alps Electric Co., Ltd. Trimmer capacitor. 4,291,361, Cl. 361-293.000.

Shirasu, Hiroshi; Ogasawara, Akira; and Utagawa, Ken, to Nippon Kogaku K.K. Light image space frequency component extracting device. 4,291,224, Cl. 250-204.000.

Shiratsuchi, Masami: *See*—
Onogi, Kazuhiro; Kunieda, Hisashi; Kawamura, Kiyoshi; Shiratsuchi, Masami; Nagakura, Masahiko; Machida, Naoki, deceased; and Miwa, Takayasu, heir, 4,290,954, Cl. 260-335.000.

Shoji, Masahiro: *See*—
Matsudo, Kazuo; Adaniya, Takeshi; Ohmura, Masaru; Shoji, Masahiro; and Watanabe, Tsutomu, 4,290,860, Cl. 204-27.000.

Shoji, Susumu: *See*—
Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, 4,291,127, Cl. 560-76.000.

Shook, Jackson A., to Evans Products Company. Freight car door locking mechanism. 4,290,232, Cl. 49-277.000.

Showa Denko Kabushiki Kaisha: *See*—
Yamada, Tsuyoshi, 4,290,776, Cl. 23-230.00R.

Shtern, Arkady V.: *See*—
Krasnov, Valery A.; Klovsky, Yakov A.; Dubov, Igor V.; Shtern, Arkady V.; Vyatkin, Viktor L.; and Shavelzon, Lev A., 4,290,665, Cl. 339-276.00T.

Shurboff, John D.: *See*—
McGregor, Charles W.; Karkoski, Joseph; and Shurboff, John D., 4,290,929, Cl. 260-29.20N.

Shuster, Nicholas; Babinsky, Andrew D.; and Kidon, William E., to Diamond Shamrock Corporation. Chromic acid production process using a three-compartment cell. 4,290,864, Cl. 204-103.000.

Sides, Daniel H.; and Beisch, Hanspeter E., to Black & Decker Inc. Idling and air replenishing system for a reciprocating hammer mechanism. 4,290,492, Cl. 173-118.000.

Siebeck, Helmut, to H. Berthold, AG. Process for running width adjustment. 4,291,381, Cl. 365-523.000.

Siegmund, Walter P., to American Optical Corporation. Fiberscope. 4,290,421, Cl. 128-6.000.

Siemens Aktiengesellschaft: *See*—
Haas, Roman, 4,291,367, Cl. 363-21.000.

Muehlbauer, Otto; Bigall, Klaus D.; and Roessler, Helmut, 4,291,221, Cl. 235-92.0CC.
Pfleiderer, Hans-Jorg; and Widmann, Dietrich, 4,291,321, Cl. 357-23.000.
Rosler, Helmut, 4,291,240, Cl. 307-262.000.
Stein, Karl-Ulrich, 4,290,187, Cl. 29-576.00B.
Stein, Karl-Ulrich, 4,290,693, Cl. 356-1.000.
Walter, Karl-Heinz, 4,291,304, Cl. 340-715.000.

Siemon, Edward C., to Borg-Warner Corporation. Power factor control system for inverter-driven a-c induction motor. 4,291,264, Cl. 318-729.000.

Sietam S.A.: *See*—
Charpentier, Jean, 4,290,439, Cl. 134-107.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Bertolini, Alfio, 4,291,035, Cl. 424-251.000.

Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-11-deoxy-19-oxo-PGE_1 compounds. 4,291,172, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-11-deoxy-9-deoxy-9-methylene-19-oxo-PFG_1 compounds. 4,291,173, Cl. 562-503.000.

Silbernagle, Richard A.: *See*—
Swisher, George W., Jr.; Steele, Thomas L.; and Silbernagle, Richard A., 4,290,820, Cl. 134-6.000.

Silkensen, Ralph D.: *See*—
Pennell, George F.; Silkensen, Ralph D.; and Wallace, Joseph E., 4,291,351, Cl. 360-113.000.

Silliman, Jeffrey E.: *See*—
Burns, Alonzo M., Jr.; Silliman, Jeffrey E.; Gilbert, Woodrow P.; and Pascoe, William M., Sr., 4,290,766, Cl. 8-491.000.

Simpson, Ronald P.: *See*—
Lessmann, Gerald G.; Simpson, Ronald P.; Reichenecker, William J.; and O'Brokta, Ronald D., 4,291,220, Cl. 219-137.00R.

Singer Company, The: *See*—
Belva, George M.; and Mecklenborg, Richard A., 4,290,669, Cl. 350-174.000.
Haas, Robert V., 4,290,657, Cl. 312-21.000.
Rohner, Michel, 4,291,380, Cl. 364-522.000.

Sinka, Joseph V.: *See*—
Villa, Jose L.; Sinka, Joseph V.; and Fleming, Joseph P., 4,290,817, Cl. 106-315.000.

Sisson, Kimberley R. Automatic count and identification carrier for refundable cans. 4,290,525, Cl. 206-427.000.

Sitek, George J.: *See*—
Bredeweg, Roger L.; and Sitek, George J., 4,290,296, Cl. 73-1.00G.

Sivyer Steel Corporation: *See*—
Whitney, Richard P., 4,290,545, Cl. 228-139.000.

Siwula, John T. Attachable microprocessors. 4,290,708, Cl. 403-24.000.

Skahill, Fred J., to United States of America, Army. Cam actuated ammunition prestripping mechanism. 4,290,339, Cl. 89-33.0CA.

Skala, Karel, to BBC Brown, Boveri & Co., Ltd. Steam power plant and control element for the plant. 4,291,378, Cl. 364-494.000.

Slater Steel Industries Limited: *See*—
Nigol, Olaf; Houston, Herbert J.; and Gretzinger, Adolf, 4,291,194, Cl. 174-40.00R.

Smirnov, Boris A.: *See*—
Fedotov, Vladimir M.; Smirnov, Boris A.; Lukomsky, Genrikh I.; and Lipovsky, Iosif L., 4,290,542, Cl. 227-155.000.

Smith, David W.: *See*—
Goetz, Richard W.; Meixsel, Lawrence D.; and Smith, David W., 4,291,179, Cl. 568-882.000.

Smith, James E.; and Baker, Gordon P., to Senco Products, Inc. Configured impact member for driven flywheel impact device. 4,290,493, Cl. 173-124.000.

Smith, Joseph L., Jr.; and Kirtley, James L., Jr., to Massachusetts Institute of Technology. Rotating electric machine with fluid supported parts. 4,291,249, Cl. 310-214.000.

Smith, Leonard R. Yarn tension device. 4,290,565, Cl. 242-152.100.

Smith, Lloyd T.: *See*—
Fee, Robert W.; TenEyck, Richard E.; and Smith, Lloyd T., 4,290,465, Cl. 145-61.00R.

Smith, Nicholas K., to Bell Telephone Laboratories, Incorporated. Voice and data switching arrangement. 4,291,200, Cl. 179-18.0BD.

Smith, Robert L. Change-a-bowl pipe. 4,290,437, Cl. 131-196.000.

Smith, Robert W.; Hemmat, Naim S.; Bedell, John R.; Kavesh, Sheldon; and Draizen, Seymour, to Allied Chemical Corporation. Nozzle geometry for planar flow casting of metal ribbon. 4,290,476, Cl. 164-423.000.

Smith, Sylvester J. Hand tool for holding electrical outlet boxes during installation to a stud or other structural member. 4,290,591, Cl. 269-6.000.

Smith, Thomas M. Radiant heating. 4,290,746, Cl. 431-328.000.

Smolik, John V.; Swanson, Ronald V.; Rubin, Charles P.; Blaschke, James C.; and Wagner, Roger J., to Hughes Aircraft Company. Three point attachment for an ejectable spacecraft. 4,290,570, Cl. 244-158.00R.

Smythe, Daniel L., Jr.: *See*—
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,291,390, Cl. 365-183.000.

Snamprogetti S.p.A: *See*—
Pagani, Giorgio; Lagana, Vincenzo; and Saviano, Francesco, 4,291,006, Cl. 423-359.000.

Snamprogetti, S.p.A.: *See*—
Degen, Ludwig; Branduzzi, Paolo; Olivieri, Roberto; and Cimini, Nadia, 4,291,123, Cl. 435-94.000.

Snap-on Tools Corporation: *See*—
Green, Talmage O., 4,290,329, Cl. 81-477.000.

Snipes, Wallace: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,291,014, Cl. 424-28.000.
Keith, Alec D.; and Snipes, Wallace, 4,291,015, Cl. 424-28.000.

Snitzer, Morton; and Fehrenbacher, Gary L., to Indiana Wood Specialty, Inc. Table and method of assembly. 4,290,371, Cl. 108-159.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Buhler, Marcel; Olofsson, Mats; and Fosseux, Pierre-Yves, 4,291,067, Cl. 426-582.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Batteux, Jacques; Blanc, Claude; and Grancher, Pierre, 4,291,003, Cl. 423-228.000.

Soehngen, John W.; and Chen, John C., to Celanese Corporation. Process for preparing microporous hollow fibers. 4,290,987, Cl. 264-41.000.

Someya, Itsuo: *See*—
Nagano, Masashi; and Someya, Itsuo, 4,290,506, Cl. 188-24.190.

Sondermeyer, Jack C. High frequency roll-off circuit. 4,290,335, Cl. 84-1.270.

Sonntag, Michael: *See*—
Hohlein, Peter; and Sonntag, Michael, 4,291,135, Cl. 525-101.000.

Sony Corporation: *See*—
Hirai, Jun, 4,291,330, Cl. 358-8.000.
Kamon, Yoshiyuki; and Kishikami, Jun, 4,291,205, Cl. 179-181.00R.
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, 4,291,253, Cl. 313-348.000.
Saito, Kenzo, 4,290,567, Cl. 242-198.000.

Sorenson, James P.: *See*—
Monter, James V.; Sorenson, James P.; and Theus, George J., 4,290,872, Cl. 204-195.00F.

Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, to Daimler-Benz Aktiengesellschaft. Mounting or attaching arrangement for driven or non-driven assemblies associated with an internal combustion engine. 4,290,397, Cl. 123-195.00A.

Southwest Research Institute: *See*—
Ludwig, Allen C.; Dale, John M.; and Frazier, Henry F., 4,290,816, Cl. 106-287.320.

Soutsos, Michael D. Method for forming lubricating films. 4,291,073, Cl. 427-314.000.

Spaniol, John W.; Bowerman, John J.; and Perlman, Marvin, to Frederick Electronics Corp. Circuit for handling conversation data in a distributed processing telex exchange. 4,291,196, Cl. 178-3.000.

Sparkle Wash, Inc.: *See*—
Shaffer, Detmer B., 4,290,442, Cl. 137-112.000.

Sperry Corporation: *See*—
Bass, David S., 4,291,386, Cl. 364-717.000.
Casey, Martin J.; Stein, Barry F.; and Wetterskog, Herman E., 4,291,091, Cl. 428-336.000.
Martenas, Wayne B., 4,290,255, Cl. 56-10.200.
Rao, Basrur R.; Ross, Gerald F.; and Cronson, Harry M., 4,291,289, Cl. 333-240.000.

Spicer, Larry D.: *See*—
Tobkes, Martin; Dann, Murray; Klothen, Irving; Spicer, Larry D.; and Williams, David R., 4,291,026, Cl. 424-181.000.

Spiller, Basil H. R.; and Pratt, Allan F., to Decca Limited. FM/CW Radar. 4,291,309, Cl. 343-7.500.

Spirko, Edward J.: *See*—
Malone, William H.; Fischley, John; Anderson, Harry L.; and Spirko, Edward J., 4,290,751, Cl. 432-214.000.

SRI International: *See*—
Henry, David W.; and Tong, George L., 4,291,157, Cl. 536-17.00A.

Stackpool, Francis M.: *See*—
Barry, Thomas I.; Schajer, Gary S.; and Stackpool, Francis M., 4,291,107, Cl. 429-104.000.

Staerzl, Richard E.: *See*—
Frank, Roy W.; and Staerzl, Richard E., 4,290,394, Cl. 123-73.00A.

Stalcup, Robert K.: *See*—
Jameikis, Saulius M.; Stalcup, Robert K.; Arnold, Joe F.; and Hon, Robert K., 4,290,237, Cl. 51-34.00A.

Stall, Alan D., to Du Pont de Nemours, E. I., and Company. Breathable fabric and sack made therefrom. 4,291,082, Cl. 428-138.000.

Stallard, Wayne R.: *See*—
Eckels, George H.; Groft, Donald H.; and Stallard, Wayne R., 4,290,584, Cl. 254-380.000.

Stamicarbon, B.V.: *See*—
Schaafsma, Sijbrandus E.; Hofman, Johannes H. A.; and Claassens, Johannes E. L., 4,291,170, Cl. 560-126.000.

Standard Oil Company: *See*—
Kiikka, Oliver A., 4,291,180, Cl. 585-320.000.
Kiikka, Oliver A.; and Li, George S., 4,291,181, Cl. 585-320.000.
Suresh, Dev D.; Brazdil, James F.; and Grasselli, Robert K., 4,290,920, Cl. 252-439.000.

Standard Oil Company (Indiana): *See*—
Beynet, Pierre A.; and Williams, Emil K., 4,290,715, Cl. 405-169.000.
Keske, Robert G.; and Stephens, James R., 4,291,149, Cl. 528-188.000.
Ridgway, John A., 4,291,063, Cl. 426-319.000.
Sharp, Shelby P.; and Yarborough, Lyman, 4,290,900, Cl. 252-8.55B.

Standard Oil Company (Ohio): *See*—
Adams, Harry A.; and Fitzgibbons, William O., 4,290,783, Cl. 55-89.000.

Stauffer, Allen R. Flexible flying disc toy. 4,290,226, Cl. 46-74.00D.

Stearley, John W.: *See*—
Reinke, William L.; and Stearley, John W., 4,291,207, Cl. 200-42.00R.

Steele, Raymond: *See—*
Jayant, Nuggehally S.; Schmidt, Carolyn E.; and Steele, Raymond, 4,291,405, Cl. 371-31.000.
Steele, Richard J. Security device. 4,290,636, Cl. 292-338.000.
Steele, Thomas L.: *See—*
Swisher, George W., Jr.; Steele, Thomas L.; and Silbernagle, Richard A., 4,290,820, Cl. 134-6.000.
Steeples, Kenneth: *See—*
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., 4,290,825, Cl. 148-33.400.
Steiger Tractor, Inc.: *See—*
Majkrzak, David S.; and Hinkel, Dwight B., 4,290,654, Cl. 301-9.0TV.
Stein, Barry F.: *See—*
Casey, Martin J.; Stein, Barry F.; and Wetterskog, Herman E., 4,291,091, Cl. 428-336.000.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Method of making charge-coupled arrangement in the two-phase technique. 4,290,187, Cl. 29-576.00B.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Arrangement for measuring the range or speed of an object. 4,290,693, Cl. 356-1.000.
Steiner, Alois, to Ruti Machinery Works Ltd. Multiple longitudinal traversing shed weaving apparatus. 4,290,458, Cl. 139-28.000.
Steiner, William G., to Lockheed Corporation. Automatic circuit tester with improved voltage regulator. 4,291,404, Cl. 371-20.000.
Steinle, Benedikt: *See—*
Schneider, Gernot; and Steinle, Benedikt, 4,291,377, Cl. 364-483.000.
Steinrucke, Walter: *See—*
Krauss, Ralf, 4,290,412, Cl. 126-419.000.
Stekly, Zdenek J. J. Magnetic separating apparatus with means for balancing magnetic forces. 4,290,528, Cl. 209-223.00R.
Stelco Inc.: *See—*
Eckels, George H.; Groft, Donald H.; and Stallard, Wayne R., 4,290,584, Cl. 254-380.000.
Stemler, Gary E.; and Scott, Donald N., to United States of America, Energy. Self-monitoring high voltage transmission line suspension insulator. 4,291,193, Cl. 174-11.00R.
Stepe, Visvaldis A., to Caterpillar Tractor Co. Earthworking implement side plate wear member. 4,290,214, Cl. 37-141.00T.
Stephens, James R.: *See—*
Keske, Robert G.; and Stephens, James R., 4,291,149, Cl. 528-188.000.
Stephenson, Rebecca A. G.: *See—*
Du Bois, Grant E.; Stephenson, Rebecca A. G.; and Crosby, Guy A., 4,290,957, Cl. 260-345.200.
Stermole, Franklin J.: *See—*
[illegible]Carthy, Patrick, 4,290,224, Cl. 46-61.000.
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., to Massachusetts Institute of Technology. Analog solid state memory. 4,291,390, Cl. 365-183.000.
Stevens, Benjamin A. Beverage can crusher. 4,290,354, Cl. 100-218.000.
Stevens, Bert E.: *See—*
Andros, Frank E.; Kerjilian, Ghazaros K.; Stevens, Bert E.; and Tomek, Reinhold E., 4,291,364, Cl. 361-384.000.
Stevens, Martin L.: *See—*
United States of America, National Aeronautics and Space Administration; and Stevens, Martin L., 4,290,612, Cl. 277-81.00R.
Stevens, Timothy S.; and Miller, Theodore E., Jr., to Dow Chemical Co., The. Analytical method for determining acid/salt and base/salt species concentration in solution. 4,290,775, Cl. 23-230.00R.
Stevenson, Andrew C.; Herzog, Gordon W.; and Murdoch, James C., to Canadian General Electric Company Limited. Amortisseur winding protection system. 4,291,263, Cl. 318-706.000.
Stiftelsen Blekinge Produkter: *See—*
Matsson, Karl J., 4,290,212, Cl. 36-33.000.
Stiverson, Richard G.: *See—*
Seabourn, Ed. O.; Patterson, Lewis W.; and Stiverson, Richard G., 4,290,759, Cl. 434-370.000.
Stocklin, Gerhard; Laufer, Peter; and Machulla, Jurgen, to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. Method of making 1^{123} labeled fatty acids. 4,290,965, Cl. 260-408.000.
Stockwell, Richard K.: *See—*
Osborne, Thomas E.; and Stockwell, Richard K., 4,291,385, Cl. 364-709.000.
Stokes, Marshall G.: *See—*
McLennan, Charles I.; Stokes, Marshall G.; and Konucik, George J., 4,290,159, Cl. 9-9.000.
Storandt, Ralf, to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH. Release setting indicating device for a ski safety binding. 4,290,624, Cl. 280-634.000.
Storcel, Joseph A., to Bunker Ramo Corporation. Connector assembly with visual, tactile and audible indication. 4,290,662, Cl. 339-89.00M.
Strang, John R.: *See—*
Scharer, Hans R.; Antrim, Richard D.; and Strang, John R., 4,290,742, Cl. 425-313.000.
Strange, Booth B., to Western Geophysical Co. of America. Marine oil leak containment and recovery apparatus. 4,290,714, Cl. 405-60.000.
Strassel, Albert, to Produits Chimiques Ugine Kuhlmann. Polyvinylidene fluoride-polyurethane laminates and method. 4,291,099, Cl. 428-421.000.
Strecker, Helmut; Molter, Michael; Kloss, Gerhard; and Schickel, Eberhard, to Hoechst Aktiengesellschaft. Technetium-labelled diagnostic agent for the examination of the RES. 4,291,012, Cl. 424-1.000.
Strobel, Manfred; and Thiersch, Friedrich, both of, to Carl Still, Firma. Method of operating horizontal coke oven batteries. 4,290,854, Cl. 201-26.000.
Struger, Odo J.: *See—*
Ecker, Donald R., Jr.; Dummermuth, Ernst; and Struger, Odo J., 4,291,388, Cl. 364-900.000.
Studtmann, George H.: *See—*
Yarema, Raymond J.; and Studtmann, George H., 4,291,368, Cl. 363-41.000.
Sturges, James R.: *See—*
Brewer, Thomas D.; Purcell, Robert J.; and Sturges, James R., 4,290,236, Cl. 51-5.00A.
Sturgis, Malcolm B., to M. B. Sturgis, Inc. Quick disconnect coupling with a heat-sensitive cutoff feature. 4,290,440, Cl. 137-75.000.
Sturm, Elmar; and Nyfeler, Robert, to Ciba-Geigy Corporation. 1H-inden-1-one derivatives, processes for producing them, their use in microbicidal compositions, and for combating microorganisms. 4,291,061, Cl. 424-331.000.
Sturm, Ruger & Co., Inc.: *See—*
Ruger, William B., 4,290,220, Cl. 42-75.00D.
Styner & Bienz AG: *See—*
Diemi, Werner, 4,290,294, Cl. 72-348.000.
Suchy, Milos, to Hoffmann-La Roche Inc. Naphthalenecarboxylic acid esters. 4,291,058, Cl. 424-308.000.
Sudan, Ravindra N., to Cornell Research Foundation, Inc. Ion-ring ignitor for inertial fusion. 4,290,848, Cl. 176-5.000.
Suenaga, Masaki: *See—*
Bussiere, Jean F.; Welch, David O.; and Suenaga, Masaki, 4,291,105, Cl. 428-616.000.
Sueoka, Tetsuro; and Ishibashi, Satoshi, to Kabushiki Kaisha Meidensha. Dual gate controlled thyristor with highly doped cathode base grid covered with high resistivity base layer. 4,291,325, Cl. 357-38.000.
Sugai, Shinzo: *See—*
Aisaka, Tatsuyoshi; Kawai, Mitsuo; Mori, Fumio; and Sugai, Shinzo, 4,290,828, Cl. 148-11.50Q.
Sugie, Mamoru: *See—*
Mayama, Koichi; Yamaguchi, Noboru; Sugie, Mamoru; Kita, Yuzo; and Yoshizawa, Shigeru, 4,291,241, Cl. 307-269.000.
Sugier, Andre; and Freund, Edouard, to Institut Francais du Petrole. Process for manufacturing alcohols and more particularly saturated linear primary alcohols from synthesis gas. 4,291,126, Cl. 518-713.000.
Suginaka, Mutsuo, to Nippon Tsusho Company Limited. Lagging body for belt conveyor pulley. 4,290,761, Cl. 474-190.000.
Sugiura, Eiichi. Aeration apparatus. 4,290,979, Cl. 261-4.000.
Sulberg, Carl: *See—*
Ibach, Adolf; and Konen, Heinz, 4,290,326, Cl. 76-101.00R.
Sulko, James C., to Syncroflo, Inc. Water pressure booster system. 4,290,735, Cl. 417-2.000.
Sulkowski, Alfred. Environmental control system. 4,290,480, Cl. 165-21.000.
Sullivan, John; and Lillibridge, Harold R., to Champion International Corporation. Reclosable envelope and method of manufacture. 4,290,547, Cl. 229-77.000.
Sullivan, Leo S., Jr.; and Muzechuk, Richard A., to General Motors Corporation. Dual function strut bearing. 4,290,626, Cl. 280-692.000.
Sullivan, William P. Lock for household refrigerators. 4,290,633, Cl. 292-114.000.
Sulzer Brothers Limited: *See—*
Juzi, Heinz, 4,290,390, Cl. 122-406.00S.
Sumitomo Chemical Company, Limited: *See—*
Yasui, Seimei; Sagou, Masakazu; Noguchi, Takanobu; Toyoshima, Yoshiki; and Saito, Junzo, 4,291,148, Cl. 528-142.000.
Sumitomo Durez Company, Ltd.: *See—*
Funabiki, Kyohei; Matsushima, Noriaki; and Inouye, Naomitsu, 4,290,928, Cl. 260-28.00P.
Sumitomo Electric Industries, Ltd.: *See—*
Asai, Tsuyoshi; Fujimori, Naoji; and Yamamoto, Takaharu, 4,290,807, Cl. 75-233.000.
Sumitomo Metal Industries, Ltd.: *See—*
Hirata, Takeyuki; Hiroki, Nobuyoshi; and Masuda, Seiichi, 4,290,802, Cl. 75-52.000.
Sumitomo Metal Mining Co., Ltd.: *See—*
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, 4,291,253, Cl. 313-348.000.
Suovaniemi, Osmo A., to Kommanditiityhtio Finnpipette Osma A. Suovaniemi. Apparatus for automatic measurement of the results of agglutination tests. 4,290,997, Cl. 422-73.000.
Superior Concrete Accessories, Inc.: *See—*
Manning, Lindley, 4,290,638, Cl. 294-89.000.
Suresh, Dev D.; Brazdil, James F.; and Grasselli, Robert K., to Standard Oil Co., The. Sb-containing catalysts by Sb-oxide impregnation. 4,290,920, Cl. 252-439.000.
Susa, Tomoo: *See—*
Sasaki, Tohru; Terasaki, Syuuzi; and Susa, Tomoo, 4,290,983, Cl. 264-22.000.
Sutela, Leo; and Laitinen, Heikki, to Oy Partek AB. Equipment for loading of an exchange platform or container. 4,290,726, Cl. 414-421.000.
Suwa, Toshio; Konagaya, Yoshiaki; and Ishii, Hiroshi, to Nippon Sanso K. K. Method for supplying powder to be used in home spray coating operation. 4,290,555, Cl. 239-8.000.
Suzuki, Eiji: *See—*
Ogawa, Kazuo; and Suzuki, Eiji, 4,291,408, Cl. 371-49.000.

Suzuki, Hiroshi: *See*—
Inoue, Sadao; Umemura, Tetsuya; Suzuki, Hiroshi; and Tago, Makoto, 4,290,806, Cl. 75-153.000.
Suzuki, Kazuo, to NGK Insulators, Ltd. Die for extruding a honeycomb structural body and a method for manufacturing the same. 4,290,743, Cl. 425-461.000.
Suzuki, Kenji: *See*—
Ito, Senji; and Suzuki, Kenji, 4,291,085, Cl. 428-215.000.
Suzuki, Masaharu: *See*—
Tanaka, Mitsuaki; and Suzuki, Masaharu, 4,291,098, Cl. 428-412.000.
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, to Canon Kabushiki Kaisha. Liquid crystal display device for camera. 4,290,686, Cl. 354-289.000.
Suzuki, Ryushi: *See*—
Matsui, Kunio; Tsuchiya, Hiroaki; Suzuki, Ryushi; and Omura, Takayoshi, 4,290,791, Cl. 55-399.000.
Suzuki, Seiko: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.
Suzuki, Yasoji; and Kamimaru, Nobuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Phase detector circuit using logic gates. 4,291,274, Cl. 328-133.000.
Svatek, Thomas A., to Polaroid Corporation. Photographic strobe apparatus. 4,290,692, Cl. 355-69.000.
Svensson, Claes G. S.: *See*—
Hedstrom, Bengt O. A.; and Svensson, Claes G. S., 4,290,269, Cl. 60-670.000.
Swales, Danvers A.; and Marshall, Michael A., to British Chrome & Chemicals Limited. Process for the production of chromium trioxide. 4,291,000, Cl. 423-53.000.
Swanson, Ronald V.: *See*—
Smolik, John V.; Swanson, Ronald V.; Rubin, Charles P.; Blaschke, James C.; and Wagner, Roger J., 4,290,570, Cl. 244-158.00R.
Swanson, Wesley S., to Eaton Corporation. Fluid mixing valve. 4,290,450, Cl. 137-606.000.
Swartwout, Everett W. Integral clip and hanger. 4,290,575, Cl. 248-316.00D.
Swedish Industrial Corporation of Canada Ltd.: *See*—
Finkel, Henry, 4,290,217, Cl. 40-389.000.
Swihart, Terence J., to Dow Corning Corporation. Dewatering fine coal slurries using two types of organopolysiloxanes. 4,290,897, Cl. 210-710.000.
Swisher, George W., Jr.; Steele, Thomas L.; and Silbernagle, Richard A., to CMI Corporation. Method and apparatus for collecting particulate material on a roadway. 4,290,820, Cl. 134-6.000.
Swiss Aluminium Ltd.: *See*—
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, 4,290,477, Cl. 164-430.000.
Wagner, Alfred; and Ames, Adolf, 4,290,290, Cl. 72-256.000.
Sybron Corporation: *See*—
Gardner, George A., 4,291,280, Cl. 331-65.000.
Syncroflo, Inc.: *See*—
Sulko, James C., 4,290,735, Cl. 417-2.000.
Syrov, Anatoly A.; Ivanchev, Sergei S.; Primachenko, Oleg N.; Demidova, Valentina A.; Polozov, Boris V.; Fionov, Vladimir I.; and Barantsevich, Evgeny N. α,α-azo-bis-isobutyric acid α,ω-bis alkyl ester derivatives and method for preparing same. 4,290,945, Cl. 260-192.000.
Szentmiklosi, Peter: *See*—
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.
Tabah, Victo V. Machine for making pure peanut butter. 4,290,560, Cl. 241-65.000.
Tabb, David L.: *See*—
Magers, Thomas A.; and Tabb, David L., 4,290,773, Cl. 23-230.00B.
Tabor, Edward; and Gerety, Robert J., to United States of America, Health & Human Services. Inactivation of non-A, non-B hepatitis agent. 4,291,020, Cl. 424-89.000.
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, to Taisho Pharmaceutical Co., Ltd. Novel hydrocortisone derivative. 4,290,962, Cl. 260-397.450.
Tadataka, Yako: *See*—
Kenji, Fujisawa; Kazuo, Katsube; Tadataka, Yako; Koich, Uemura; Yuichi, Harada; and Yasumasa, Sakai, 4,291,090, Cl. 428-327.000.
Tago, Makoto: *See*—
Inoue, Sadao; Umemura, Tetsuya; Suzuki, Hiroshi; and Tago, Makoto, 4,290,806, Cl. 75-153.000.
Taguchi, Sadanori: *See*—
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.
Taguchi, Tetsuya: *See*—
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,291,223, Cl. 250-201.000.
Taiheiyo Engineering Inc.: *See*—
Takahashi, Ken; and Ito, Tsunetoshi, 4,290,648, Cl. 299-1.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, 4,290,962, Cl. 260-397.450.
Tait, Robert J., to Littelfuse, Inc. Apparatus for making plug-in fuse assemblies. 4,290,183, Cl. 29-564.800.
Takada, Shigetaka; and Morino, Toshiharu, to Aisan Industry Co., Ltd. Floatless variable venturi type carburetor. 4,290,399, Cl. 123-439.000.
Takago, Toshio, to Shin-Etsu Chemical Co., Ltd. Epoxy-based curable compositions. 4,291,144, Cl. 528-26.000.
Takahashi, Hidehiko. Apparatus for developing photographed film. 4,290,687, Cl. 354-320.000.
Takahashi, Ken; and Ito, Tsunetoshi, to Taiheiyo Engineering Inc. Mining apparatus. 4,290,648, Cl. 299-1.000.
Takahashi, Kihei, to Yoshida Kogyo K. K. Apparatus for interengaging opposed rows of slide fastener coupling elements. 4,290,194, Cl. 29-766.000.
Takahashi, Koichi; and Higuchi, Megumu, to Nissan Motor Company, Limited. Rotary-motion valve and power-assisted steering system incorporating the valve. 4,290,452, Cl. 137-625.230.
Takahashi, Minoru: *See*—
Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, 4,291,293, Cl. 338-4.000.
Takahashi, Yasunobu; Fujimoto, Einosuke; Shimizu, Toshio; and Kato, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Preparation of hexamethyleneimine. 4,290,946, Cl. 260-239.00B.
Takakuwa, Takeshi, to Nagata Seisakusho Co., Ltd. Flotator. 4,290,886, Cl. 210-219.000.
Takamura, Tooru; Terakawa, Sumio; Nakatani, Hirokuni; and Murozono, Izumi, to Matsushita Electronics Corporation. Electric charge transfer apparatus. 4,291,337, Cl. 358-213.000.
Takara Company: *See*—
Yoshiyuki, Hidetoshi, 4,290,659, Cl. 312-224.000.
Takasaki, Takao. Spectacle holder. 4,290,522, Cl. 206-5.000.
Takaya, Takao; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. 3-Phosphonocephalosporanic acid derivatives, and pharmaceutical composition comprising the same. 4,291,031, Cl. 424-246.000.
Takayasu, Kiyosumi. Process for welding of noble metal foil. 4,291,216, Cl. 219-118.000.
Takemae, Yoshihiro: *See*—
Nakano, Masao; Nakano, Tomio; Takemae, Yoshihiro; and Kabashima, Katsuhiko, 4,291,394, Cl. 365-206.000.
Takenaga, Mutsuo; and Yamamoto, Osamu, to Matsushita Electric Industrial Co., Ltd. Process for producing a lithium borate thermoluminescent and fluorescent substance. 4,290,909, Cl. 252-301.40R.
Takenoya, Hideaki: *See*—
Tonomura, Yoshinobu; Fujimura, Toshio; Hara, Masanori; and Takenoya, Hideaki, 4,290,375, Cl. 112-121.120.
Takeshima, Masaki: *See*—
Horiuchi, Susumu; Taniguchi, Takashi; Takeshima, Masaki; Hirano, Mikio; and Yusa, Hideo, 4,290,908, Cl. 252-301.10W.
Takeuchi, Norisada: *See*—
Ogawa, Mutsuo; Murayama, Noboru; Konishi, Akira; and Takeuchi, Norisada, 4,291,339, Cl. 358-260.000.
Taki, Yasuo; Araki, Shigeru; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, to Matsushita Electric Industrial Co. Ltd. Apparatus for carrying and placing components. 4,290,732, Cl. 414-752.000.
Tamura, Shuichi: *See*—
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,291,223, Cl. 250-201.000.
Tamura, Yorikazu; Aoki, Akihiro; and Shimada, Keizo, to Teijin, Limited. Crosslinked aromatic polyamide film and process for producing the same. 4,291,142, Cl. 525-420.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Harada, Kiyoshi; Koida, Yoshiyuki; and Miura, Hiroshi, 4,290,910, Cl. 252-312.000.
Tanaka, Atsushi: *See*—
Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, 4,290,385, Cl. 118-730.000.
Tanaka, Chiaki; Morikawa, Masanobu; and Kohno, Yoshio, to Toray Industries, Inc. Vulcanizable polyblend. 4,290,927, Cl. 260-3.000.
Tanaka, Ko, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust silencer, especially for small vehicles. 4,290,501, Cl. 181-228.000.
Tanaka, Mitsuaki; and Suzuki, Masaharu, to Nippon Fine Chemical Co., Ltd.; and Nippon Aspherical Lens Co., Ltd. Organoalkoxysilane coating compositions for plastic articles. 4,291,098, Cl. 428-412.000.
Tanaka, Souhei: *See*—
Taki, Yasuo; Araki, Shigeru; Mori, Kazuhiro; Misawa, Yoshihiko; and Tanaka, Souhei, 4,290,732, Cl. 414-752.000.
Tanaka, Yoshiyuki: *See*—
Ohkoshi, Akio; Ishii, Eiji; Nakayama, Akira; Kato, Shoji; and Tanaka, Yoshiyuki, 4,291,253, Cl. 313-348.000.
Tandon, Amar N.; and Bhasin, Ram B. Signal lanterns for optional colored light emittance. 4,291,365, Cl. 362-281.000.
Taniguchi, Takashi: *See*—
Horiuchi, Susumu; Taniguchi, Takashi; Takeshima, Masaki; Hirano, Mikio; and Yusa, Hideo, 4,290,908, Cl. 252-301.10W.
Tanizaki, Yoshiharu; Minagawa, Kenichiro; Akimoto, Shinichi; and Horioka, Kuninori, to Nippon Oil and Fats Co., Ltd. Wood fibrous material and a method for improving the qualities thereof. 4,291,101, Cl. 428-514.000.
Tatsumi, Hideo: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Tohkairin, Akira; and Sayo, Kosaku, 4,290,295, Cl. 72-356.000.

Tatsumi, Tadao. Building for cold districts. 4,290,415, Cl. 126-429.000.
Tauscher, Manfred: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,291,037, Cl. 424-253.000.
Taylor, Geoffrey W.: *See—*
Chatterjee, Pallab K.; and Taylor, Geoffrey W., 4,291,391, Cl. 365-184.000.
Taylor, John A., to Extracorporeal Medical Specialties, Inc. Non-uniform cross-sectional area hollow fibers. 4,291,096, Cl. 428-398.000.
Taylor, John R.: *See—*
Fowler, Eliot P.; and Taylor, John R., 4,290,663, Cl. 339-143.00R.
Taylor, Peter A.: *See—*
Wishman, Marvin; Taylor, Peter A.; and Leininger, James C., 4,291,093, Cl. 428-379.000.
TDK Electronics Co., Ltd.: *See—*
Horigome, Eiji; Ota, Hiroshi; and Azegami, Hitoshi, 4,291,100, Cl. 428-424.200.
Technical Materials, Inc.: *See—*
Rosenbloom, Percy, Jr.; and Rosenbloom, Percy, III, 4,290,468, Cl. 150-49.000.
Technical Services, Societe Anonyme: *See—*
t'Kint de Roodenbeke, Amaury H., 4,290,230, Cl. 49-49.000.
Tedeschi, Rinaldo R.; and Full, Gary G., to United Technologies Corporation. Spark plug load testing for an internal combustion engine. 4,291,383, Cl. 364-551.000.
Tedeschi, Rinaldo R.: *See—*
Full, Gary G.; and Tedeschi, Rinaldo R., 4,291,382, Cl. 364-551.000.
Teijin Limited: *See—*
Inata, Hiroo; Matsumura, Shunichi; and Ogasawara, Makoto, 4,291,152, Cl. 528-289.000.
Tamura, Yorikazu; Aoki, Akihiro; and Shimada, Keizo, 4,291,142, Cl. 525-420.000.
Tendulkar, Dilip V.: *See—*
Mann, Gamdur S.; Tendulkar, Dilip V.; and Parker, William J., 4,290,263, Cl. 60-311.000.
TenEyck, Richard E.: *See—*
Fee, Robert W.; TenEyck, Richard E.; and Smith, Lloyd T., 4,290,465, Cl. 145-61.00R.
Terakawa, Sumio: *See—*
Takamura, Tooru; Terakawa, Sumio; Nakatani, Hirokuni; and Murozono, Izumi, 4,291,337, Cl. 358-213.000.
Terasaki, Syuuzi: *See—*
Sasaki, Tohru; Terasaki, Syuuzi; and Susa, Tomoo, 4,290,983, Cl. 264-22.000.
Texaco Inc.: *See—*
Herbstman, Sheldon; and Dorn, Peter, 4,290,778, Cl. 44-71.000.
Levine, Stephen A.; and White, William R., 4,290,902, Cl. 252-32.70E.
Royle, Rae A., 4,290,901, Cl. 252-8.55C.
Texas Instruments Incorporated: *See—*
Beecroft, Harold J.; and Davis, Max G., Jr., 4,291,346, Cl. 360-75.000.
Chatterjee, Pallab K.; and Taylor, Geoffrey W., 4,291,391, Cl. 365-184.000.
Fletcher, Robert L.; VanLandingham, Richard D.; Brown, Sheldon H.; and Rittman, Alan H., 4,291,353, Cl. 360-128.000.
Korenstein, Ralph; and Castro, Carlos A., 4,290,843, Cl. 156-628.000.
Kuo, Chang-Kiang, 4,290,184, Cl. 29-571.000.
Lien, Jih-Chang; and Chiu, Te-Long, 4,291,328, Cl. 357-59.000.
Textron Inc.: *See—*
Moertel, George B., 4,290,175, Cl. 24-205.13D.
Tezanos, Enrique H.: *See—*
Nogueira, Eduardo D.; Infanzon, Luis Alonso S.; and Tezanos, Enrique H., 4,290,863, Cl. 204-99.000.
Theeuwes, Felix: *See—*
Luschen, Joseph G.; and Theeuwes, Felix, 4,290,426, Cl. 128-260.000.
Thermatime A.G.: *See—*
Waggott, David, 4,290,435, Cl. 128-800.000.
Theus, George J.: *See—*
Monter, James V.; Sorenson, James P.; and Theus, George J., 4,290,872, Cl. 204-195.00F.
Thibodeau, Michael J.: *See—*
Poulos, Andrew C.; and Thibodeau, Michael J., 4,291,005, Cl. 423-321.00R.
Thiersch, Friedrich, both of: *See—*
Strobel, Manfred; and Thiersch, Friedrich, both of, 4,290,854, Cl. 201-26.000.
Thim, Stig. Method of manufacturing concrete sleeper blocks and a matrix array for carrying out the method. 4,290,991, Cl. 264-157.000.
Thomas J. Lipton, Inc.: *See—*
Anema, Pieter J.; Haisman, Derek R.; and Adams, Rose M., 4,291,066, Cl. 426-578.000.
Mitchell, Robert M., 4,290,521, Cl. 206-0.500.
Thomas, Larry A., to United States of America, Navy. Automatic exposure control for pulsed active TV systems. 4,291,338, Cl. 358-228.000.
Thomas, William P.: *See—*
Hinz, Lorne C.; and Thomas, William P., 4,291,299, Cl. 340-347.0AD.
Thompson, Christopher J., to Montreal Neurological Institute. Detector shape and arrangement for positron annihilation imaging device. 4,291,228, Cl. 250-363.00S.
Thompson, Robert E., to PPG Industries Canada Ltd. Subterranean cavity chimney development for connecting solution mined cavities. 4,290,650, Cl. 299-4.000.
Thomson-CSF: *See—*
Castera, Jean P., 4,291,283, Cl. 331-96.000.
Thouvenin, Maurice: *See—*
Grassin, Jerome; Thouvenin, Maurice; and Epie, Jean-Claude, 4,290,544, Cl. 228-7.000.
Three Rivers Enterprises, Inc.: *See—*
McCahill, David I., 4,291,376, Cl. 364-483.000.
Thunker, Norbert, to Heidelberger Druckmaschinen AG. Rotatable advance or forward gripper drum. 4,290,595, Cl. 271-277.000.
Thyssen Industrie AG: *See—*
Kockerols, Erhard; and Sagemuller, Albert, 4,290,153, Cl. 4-491.000.
Tibbetts, Charles C. Method of image reproduction and materials therefor. 4,291,116, Cl. 430-308.000.
Tieden, Jansey D.: *See—*
Burton, James M.; Miller, Robert L.; and Tieden, Jansey D., 4,291,384, Cl. 364-560.000.
Timex Corporation: *See—*
Hochstrate, Paul E., 4,291,369, Cl. 363-60.000.
Wuthrich, Paul; and Mascia, Frank, 4,291,397, Cl. 368-35.000.
Tipton, Larry J., to ACF Industries, Inc. Carburetor with sonic fuel atomizer. 4,290,405, Cl. 123-590.000.
Tischer, Werner: *See—*
Liebert, Karl-Heinz; and Tischer, Werner, 4,290,738, Cl. 418-61.00B.
Titan Kogyo Kabushiki Kaisha: *See—*
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, 4,291,010, Cl. 423-594.000.
t'Kint de Roodenbeke, Amaury H., to Technical Services, Societe Anonyme. Gate for supermarkets and similar establishments. 4,290,230, Cl. 49-49.000.
Tobkes, Martin; Dann, Murray; Klothen, Irving; Spicer, Larry D.; and Williams, David R., to American Cyanamid Company. Antibiotic BM123ν pamoate complexes. 4,291,026, Cl. 424-181.000.
Todaka, Hironori: *See—*
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Hattori, Satoru, 4,291,140, Cl. 525-321.000.
Tohkairin, Akira: *See—*
Kanamaru, Hisanobu; Tatsumi, Hideo; Tohkairin, Akira; and Sayo, Kosaku, 4,290,295, Cl. 72-356.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kato, Masaaki; and Ogi, Keisuke, 4,291,332, Cl. 358-19.000.
Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, 4,290,385, Cl. 118-730.000.
Suzuki, Yasoji; and Kamimaru, Nobuyuki, 4,291,274, Cl. 328-133.000.
Uesugi, Nobuo; Miyazawa, Tatsuo; Furudate, Mituaki; Sasaki, Keiichi; and Mizuguchi, Hiroji, 4,290,849, Cl. 176-19.00R.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Aisaka, Tatsuyoshi; Kawai, Mitsuo; Mori, Fumio; and Sugai, Shinzo, 4,290,828, Cl. 148-11.50Q.
Tomas, Carlos: *See—*
DeGeorge, Bernard J.; Hermanson, Dean E.; and Tomas, Carlos, 4,290,463, Cl. 141-387.000.
Tomek, Reinhold E.: *See—*
Andros, Frank E.; Kerjilian, Ghazaros K.; Stevens, Bert E.; and Tomek, Reinhold E., 4,291,364, Cl. 361-384.000.
Tomy Kogyo Co., Inc.: *See—*
Matsumoto, Takao, 4,290,605, Cl. 273-110.000.
Tong, George L.: *See—*
Henry, David W.; and Tong, George L., 4,291,157, Cl. 536-17.00A.
Tonomura, Yoshinobu; Fujimura, Toshio; Hara, Masanori; and Takenoya, Hideaki, to Janome Sewing Machine Co., Ltd. Apparatus for writing and using embroidery information on magnetic tape. 4,290,375, Cl. 112-121.120.
Topor, Michael G.; Wicklund, Peter A.; and Ivers, John T., to Frito-Lay, Inc. Method and apparatus for extruding a plurality of ribbons. 4,290,989, Cl. 264-142.000.
Toray Industries, Incorporated: *See—*
Muraki, Toshio, 4,290,935, Cl. 260-32.6NA.
Tanaka, Chiaki; Morikawa, Masanobu; and Kohno, Yoshio, 4,290,927, Cl. 260-3.000.
Torok, Gabor; Sarosi, Lajos; Grof, Ferenc; Becsei, Tamas; and Barta, Peter, to Egyesult Muszaki Tomito es Gepszakmai Ipari Szovetkezet. Process and apparatus for cleaning contaminated water. 4,290,894, Cl. 210-661.000.
Toth, Dolan H., to Control Data Corporation. Memory system using faulty bubble memory devices. 4,291,389, Cl. 365-15.000.
Towae, Friedrich: *See—*
Merger, Franz; and Towae, Friedrich, 4,290,970, Cl. 260-453.00P.
Towle, Herbert C.: *See—*
Marshall, Albert H.; and Towle, Herbert C., 4,290,757, Cl. 434-12.000.
Toyo Boseki Kabushiki Kaisha Co., Ltd.: *See—*
Miyake, Hideo; Sakamoto, Junichi; Sawaki, Masakazu; and Hara, Mamoru, 4,290,938, Cl. 260-40.00R.
Toyo Jozo Company, Ltd.: *See—*
Otani, Masaru; Satoi, Shuzo; Muto, Naoki; Saito, Tetsu; Fujii, Tadashiro; Katsumata, Seiji; Hayashi, Mitsuo; and Ono, Masaru, 4,291,021, Cl. 424-121.000.
Toyo Seikan Kaisha Limited: *See—*
Ito, Senji; and Suzuki, Kenji, 4,291,085, Cl. 428-215.000.

Toyoshima, Yoshiki: *See—*
Yasui, Seimei; Sagou, Masakazu; Noguchi, Takanobu; Toyoshima, Yoshiki; and Saito, Junzo, 4,291,148, Cl. 528-142.000.
Toyota, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Solid titanium catalyst composition for production of an olefin polymer or copolymer. 4,290,915, Cl. 252-429.00B.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.
Tracy, Paul D.: *See—*
Davis, Robert W.; and Tracy, Paul D., 4,290,664, Cl. 339-156.00R.
Trainer, Lawrence E. Coal stove. 4,290,410, Cl. 126-146.000.
Trasavage, Robert: *See—*
Boduch, Paul; and Trasavage, Robert, 4,291,118, Cl. 430-313.000.
Tremp, Walter, to Schlossfabrik Schulte & Co. Hanger device, particularly for pipelines in buildings. 4,290,571, Cl. 248-59.000.
Trenec, Gerard: *See—*
Pinard, Michel; Aminoff, Carl; Trenec, Gerard; and Laloe, Franck, 4,291,281, Cl. 331-94.50C.
Trent, Jett B.; and Murphy, Jimmy L., to United States of America, Energy. Apparatus for maintaining alignment of a shrinking weld joint in an electron-beam welding operation. 4,291,219, Cl. 219-121.0EY.
Tresper, Erhard: *See—*
Hucks, Uwe; Wulff, Claus; Tresper, Erhard; Vernaleken, Hugo; and Selbeck, Harald, 4,290,977, Cl. 260-973.000.
Triestram, Douglas E.: *See—*
McPherson, Alex L.; Triestram, Douglas E.; and Lawrence, James E., Jr., 4,290,836, Cl. 156-171.000.
Triplett, William C.; and Brauer, Walter H. Ablatible drill. 4,290,498, Cl. 175-379.000.
Tropicana Products, Inc.: *See—*
Rossi, Anthony T., 4,290,797, Cl. 65-335.000.
Trouve, Jean: *See—*
Maupre, Jean-Pierre; and Trouve, Jean, 4,290,822, Cl. 134-19.000.
Trumble, William P., to Northern Telecom Limited. Pulp insulation repair. 4,291,094, Cl. 428-380.000.
Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. MOS Devices. 4,291,327, Cl. 357-52.000.
Tsuchiya, Hidetaka: *See—*
Nakajima, Koichi; and Tsuchiya, Hidetaka, 4,291,402, Cl. 368-276.000.
Tsuchiya, Hiroaki: *See—*
Matsui, Kunio; Tsuchiya, Hiroaki; Suzuki, Ryushi; and Omura, Takayoshi, 4,290,791, Cl. 55-399.000.
Tsukahara, Hirokazu; Fuchigami, Mitsuru; and Kagota, Nobuhiro, to Mitsubishi Paper Mills, Ltd. Desensitizer for no-carbon copy paper. 4,291,102, Cl. 428-537.000.
Tsunefuji, Katsuhiko: *See—*
Maitani, Yoshihisa; and Tsunefuji, Katsuhiko, 4,290,681, Cl. 354-230.000.
Tsunekawa, Tokuichi: *See—*
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,291,223, Cl. 250-201.000.
Tu, Hosheng, to UOP Inc. Transalkylation process. 4,291,186, Cl. 585-475.000.
Tucker, Robert S. Stave assemblies, staves, and tubs constructed therewith. 4,290,241, Cl. 52-36.000.
Turcotte, Joseph G. Cytotoxic liponucleotide analogs. 4,291,024, Cl. 424-180.000.
Turner, Larry G., to Bristol Corporation. Valve plate. 4,290,445, Cl. 137-359.000.
Tuthill, Richard S.: *See—*
Coburn, Robert E.; Gabriel, Ronald M.; and Tuthill, Richard S., 4,290,558, Cl. 239-400.000.
Tuttle, Lawrence L.: *See—*
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,290,865, Cl. 204-106.000.
Twite, Terrance M.; and Huston, Wilmer S. Electrical power generating system. 4,290,266, Cl. 60-641.200.
UBE Industries, Ltd.: *See—*
Sasaki, Yoshikazu; Inoue, Hiroshi; Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,290,936, Cl. 260-33.40P.
Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; and Kurafuji, Toshio, 4,290,922, Cl. 252-456.000.
Uchiyama, Takashi: *See—*
Saito, Syuichiro; Uchiyama, Takashi; and Yoshida, Syozo, 4,290,682, Cl. 354-234.000.
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,290,686, Cl. 354-289.000.
Udagawa, Takashi: *See—*
Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, 4,290,385, Cl. 118-730.000.
Ueda, Takeo; and Asano, Shuichi, to Nippon Seiko Kabushiki Kaisha. Seat belt emergency locking device. 4,290,629, Cl. 280-806.000.
Uema, Kenyu: *See—*
Kawashima, Kenichi; Yasuda, Hiroshi; and Uema, Kenyu, 4,291,231, Cl. 250-492.00A.
Uemura, Koretoshi: *See—*
Akabayashi, Hiroshi; Ohyama, Eiji; Shoji, Susumu; Adachi, Masami; Uemura, Koretoshi; and Ogawa, Yoshihisa, 4,291,127, Cl. 560-76.000.
Uenishi, Toshiaki: *See—*
Senda, Jihei; Inoue, Yoshihiro; Uenishi, Toshiaki; Harada, Hidefumi; Nakata, Kouji; and Akagi, Akio, 4,291,010, Cl. 423-594.000.
Uesugi, Nobuo; Miyazawa, Tatsuo; Furudate, Mituaki; Sasaki, Keiichi; and Mizuguchi, Hiroji, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear reactor. 4,290,849, Cl. 176-19.00R.
Ultimate Resources, Inc.: *See—*
Roman, Walter C., 4,290,703, Cl. 366-345.000.
Ultra Electronic Controls Limited: *See—*
Duckworth, Roger G., 4,290,875, Cl. 204-298.000.
Umehara, Akira: *See—*
Kondoh, Syunichi; Matsufuji, Akihiro; and Umehara, Akira, 4,290,870, Cl. 204-159.150.
Umemura, Sumio; Ohdan, Kyoji; Hidaka, Mikio; and Kurafuji, Toshio, to Ube Industries, Ltd. Ammoxidation catalyst for the production of acrylonitrile from propylene and process for producing the same. 4,290,922, Cl. 252-456.000.
Umemura, Tetsuya: *See—*
Inoue, Sadao; Umemura, Tetsuya; Suzuki, Hiroshi; and Tago, Makoto, 4,290,806, Cl. 75-153.000.
Unarco Industries, Inc.: *See—*
Gallagher, Ronald M.; Nadler, Michael E.; Highsmith, Charles E.; and Minchey, Richard L., 4,290,370, Cl. 108-53.500.
Unger, William O. Horse boot. 4,290,487, Cl. 168-18.000.
Unican Security Systems, Ltd.: *See—*
Fish, Aaron M.; and Dausseing, Jean-Paul, 4,290,279, Cl. 70-38.00A.
Unimed, Inc.: *See—*
Mulinos, Michael G., 4,291,030, Cl. 424-245.000.
Union Carbide Corporation: *See—*
Beach, William F.; and Mahoney, Dennis M., 4,291,244, Cl. 307-400.000.
Brookstein, David S.; and Colcord, Alton R., 4,290,170, Cl. 19-236.000.
Keogh, Michael J., 4,291,136, Cl. 525-102.000.
Malone, Thomas R.; Foster, Talmage D., Jr., deceased; and Foster, Sue T., executrix, 4,290,899, Cl. 252-8.50A.
Nowlin, Thomas E.; and Raschke, Curt R., 4,291,245, Cl. 307-400.000.
Pelton, John F., 4,290,588, Cl. 266-225.000.
Seldin, Emanuel J.; and Weng, Tu-Lung, 4,290,709, Cl. 403-296.000.
Selines, Ronald J., 4,290,293, Cl. 72-342.000.
Wheeler, Thomas N., 4,291,057, Cl. 424-304.000.
United Kingdom Atomic Energy Authority: *See—*
Brown, Stuart R.; Feest, Eric A.; and Leach, Fred, 4,291,070, Cl. 427-213.000.
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., 4,290,825, Cl. 148-33.400.
Fowler, Eliot P.; and Taylor, John R., 4,290,663, Cl. 339-143.00R.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Daniels, Stephen, 4,290,432, Cl. 128-660.000.
United States of America
Agriculture: *See—*
McGovern, Terrence P.; and Schreck, Carl E., 4,291,041, Cl. 424-267.000.
Air Force: *See—*
Harris, Clarence J., 4,290,302, Cl. 73-86.000.
Vollmoeller, Philip K., 4,290,568, Cl. 244-122.00A.
Army: *See—*
Holmes, Allen B., 4,291,395, Cl. 367-83.000.
Jones, Terry L.; and Miller, Brian S., 4,291,068, Cl. 427-88.000.
Skahill, Fred J., 4,290,339, Cl. 89-33.0CA.
Energy: *See—*
Blanz, John H., 4,290,494, Cl. 173-149.000.
Brewer, Given A., 4,290,311, Cl. 73-730.000.
Bussiere, Jean F.; Welch, David O.; and Suenaga, Masaki, 4,291,105, Cl. 428-616.000.
Caldwell, John T.; Fehlau, Paul E.; and France, Stephen W., 4,291,227, Cl. 250-328.000.
Campbell, David O.; and Buxton, Samuel R., 4,290,967, Cl. 260-429.00R.
Engelhaupt, Darell E., 4,290,858, Cl. 204-12.000.
Stemler, Gary E.; and Scott, Donald N., 4,291,193, Cl. 174-11.00R.
Trent, Jett B.; and Murphy, Jimmy L., 4,291,219, Cl. 219-121.0EY.
Health & Human Services: *See—*
Tabor, Edward; and Gerety, Robert J., 4,291.020, Cl. 424-89.000.
Interior: *See—*
Blickensderfer, Robert, 4,290,877, Cl. 204-298.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Stevens, Martin L. Surface conforming thermal/pressure seal. 4,290,612, Cl. 277-81.00R.
National Aeronautics and Space Administration: *See—*
Chase, Wendell D., 4,291,294, Cl. 340-26.000.
Frosch, Robert A.; and Qader, Shaik A., 4,290,779, Cl. 48-89.000.
Navy: *See—*
Baum, Kurt; and Guest, Allen M., 4,291,171, Cl. 560-156.000.
Daugherty, Thomas L., 4,290,656, Cl. 308-121.000.
Kaloi, Cyril M., 4,291,311, Cl. 343-700.0MS.
Kaloi, Cyril M., 4,291,312, Cl. 343-700.0MS.

Marshall, Albert H.; and Towle, Herbert C., 4,290,757, Cl. 434-12.000.
Martin, Gordon E., 4,291,396, Cl. 367-154.000.
McLandrich, Matthew N., 4,290,697, Cl. 356-350.000.
Thomas, Larry A., 4,291,338, Cl. 358-228.000.

U.S. Philips Corporation: *See—*
Bijma, Jan; Joeres, Helmut; and Johanns, Johannes H. M., 4,291,251, Cl. 313-413.000.
Disco, Paulus J.; Quargentan, Ernesto; and Santalucia, Pietro, 4,290,275, Cl. 62-238.600.

United States Steel Corporation: *See—*
Capriotti, Alfred J., 4,290,289, Cl. 72-31.000.

United Technologies Corporation: *See—*
Coburn, Robert E.; Gabriel, Ronald M.; and Tuthill, Richard S., 4,290,558, Cl. 239-400.000.
Full, Gary G.; and Tedeschi, Rinaldo R., 4,291,382, Cl. 364-551.000.
Jameikis, Saulius M.; Stalcup, Robert K.; Arnold, Joe F.; and Hon, Robert K., 4,290,237, Cl. 51-34.00A.
Tedeschi, Rinaldo R.; and Full, Gary G., 4,291,383, Cl. 364-551.000.
Wynosky, Thomas A.; Campbell, Charles A.; and Mischke, Robert J., 4,290,262, Cl. 60-262.000.

University of California, The Regents of the: *See—*
O'Farrell, Patrick H., 4,290,855, Cl. 204-1.500.

Untz, Robert W.: *See—*
Kizer, Richard W.; Anderson, Arlynn W.; and Untz, Robert W., 4,290,990, Cl. 264-156.000.

UOP Inc.: *See—*
Antos, George J., 4,290,921, Cl. 252-441.000.
Carlson, David H. J., 4,290,916, Cl. 252-430.000.
Carlson, David H. J., 4,290,917, Cl. 252-430.000.
Frame, Robert R., 4,290,913, Cl. 252-428.000.
Homeier, Edwin H., 4,291,143, Cl. 526-123.000.
Tu, Hosheng, 4,291,186, Cl. 585-475.000.

Upjohn Company, The: *See—*
Morton, Douglas R., Jr., 4,291,159, Cl. 542-400.000.
Sih, John C., 4,291,172, Cl. 562-503.000.
Sih, John C., 4,291,173, Cl. 562-503.000.

Urlaub, Alfred, to Maschinenfabrik Augsburg-Nuremberg Aktiengesellchaft. Heat conducting shield for cylinder heads of internal combustion engines. 4,290,396, Cl. 123-193.0CH.

Uroshevich, Miroslav, to Alpha Solarco Inc. Solar collectors. 4,290,418, Cl. 126-439.000.

Usa, Mikio: *See—*
Kuwata, Takeo; Shimada, Shoji; and Usa, Mikio, 4,290,337, Cl. 411-2.000.

Usami, Toshimasa: *See—*
Kobayashi, Tomoyuki; Usami, Toshimasa; Misu, Hiroshi; and Sera, Hidefumi, 4,291,120, Cl. 430-531.000.

USM Corporation: *See—*
Scharer, Hans R.; Antrim, Richard D.; and Strang, John R., 4,290,742, Cl. 425-313.000.

Utagawa, Ken: *See—*
Shirasu, Hiroshi; Ogasawara, Akira; and Utagawa, Ken, 4,291,224, Cl. 250-204.000.

Vacumet Finishing Inc.: *See—*
Wallace, James J., 4,290,523, Cl. 206-0.820.

Vacuumschmelze GmbH: *See—*
Pfeifer, Friedrich; and Behnke, Wernfried, 4,290,827, Cl. 148-108.000.

Vakil, Himanshu B., to General Electric Company. Means and method for independently controlling vapor compression cycle device evaporator superheat and thermal transfer capacity. 4,290,272, Cl. 62-114.000.

Valeriote, Michael A.; Kellman, Louis C.; and Brandigampola, Don E. Antenna coupler. 4,291,284, Cl. 333-17.00M.

Valliere, Robert, to Scott & Williams, Incorporated. Air-controlled needle latch closing for knitting machine. 4,290,277, Cl. 66-24.000.

Van Breen, Abraham J., to Dysan Corporation. Rigid disc handling device and method. 4,290,734, Cl. 414-786.000.

van den Berg, Johan H., to Archambel, S.A. Adaptor for connecting a wiper blade to a wiper arm. 4,290,164, Cl. 15-250.320.

Van Dyke, John W., Jr.; and Kurchacova, Elva, to Miles Laboratories, Inc. Tetrahydro β-carbolines having anti-hypertensive activity. 4,291,039, Cl. 424-256.000.

VanLandingham, Richard D.: *See—*
Fletcher, Robert L.; VanLandingham, Richard D.; Brown, Sheldon H.; and Rittman, Alan H., 4,291,353, Cl. 360-128.000.

Vanlerberghe, Guy: *See—*
Sebag, Henri; and Vanlerberghe, Guy, 4,290,956, Cl. 260-338.000.

Varadi, Andrew G.: *See—*
Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,290,186, Cl. 29-576.00B.

Varian Associates, Inc.: *See—*
Abbott, Seth R., 4,290,892, Cl. 210-656.000.
Anderson, Weston A., 4,290,310, Cl. 73-626.000.

Vassar, Clyde W.: *See—*
Kemerer, William J.; and Vassar, Clyde W., 4,290,248, Cl. 52-309.160.

Vayssie, Charles: *See—*
Bouillon, Claude; and Vayssie, Charles, 4,290,974, Cl. 260-511.000.

Veeder, George T.: *See—*
Kang, Kenneth S.; and Veeder, George T., 4,291,156, Cl. 536-1.000.

Velsicol Chemical Corporation: *See—*
Luteri, George F., 4,291,158, Cl. 536-115.000.

Veprintsev, Vladimir I.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH: *See—*
Storandt, Ralf, 4,290,624, Cl. 280-634.000.

Vereschagin, Leonid F.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Vermont American Corp.: *See—*
Clark, Clyde C., 4,290,328, Cl. 81-62.000.

Vernaleken, Hugo: *See—*
Hucks, Uwe; Wulff, Claus; Tresper, Erhard; Vernaleken, Hugo; and Selbeck, Harald, 4,290,977, Cl. 260-973.000.

Victor Company of Japan, Ltd.: *See—*
Ohira, Tsunehisa, 4,291,345, Cl. 360-62.000.

Videau, Daniel: *See—*
Gorgerino, Mario; and Videau, Daniel, 4,290,805, Cl. 75-130.00R.

Vignon, Louis, to Heberlein Hispano SA. Apparatus for forming a fiber strand into cycloidal loops. 4,290,169, Cl. 19-159.00R.

Villa, Jose L.; Sinka, Joseph V.; and Fleming, Joseph P., to Diamond Shamrock Corporation. Glucoheptonate composition. 4,290,817, Cl. 106-315.000.

Villa, Oscar; and Falcon, Jorge A. Convertible container-holder that becomes the neck of a folding receptacle. 4,290,466, Cl. 150-1.000.

Virag, Sandor: *See—*
Knoll, Jozsef; Meszaros, Zoltan; Hermecz, Istvan; Fulop, Ferenc; Bernath, Gabor; Virag, Sandor; Nagy, Gabor; and Szentmiklosi, Peter, 4,291,036, Cl. 424-251.000.

Vita Vet Research Group Inc.: *See—*
Jewett, Warren R., 4,290,434, Cl. 128-680.000.

Vlahov, Radoslav Y.; Krikoryan, Dikran A.; Zagorova, Maria S.; Ninova, Maya H.; and Parushev, Stoyan P., to Edinen Centar P Chimia. Method for the preparation of narwedine-type enones. 4,290,862, Cl. 204-59.00R.

Vockenhuber, Peter, to Bolex International SA. Camera. 4,290,679, Cl. 354-196.000.

Voest-Alpine Aktiengesellschaft: *See—*
Kagerhuber, Franz; and Holleis, Gunter, 4,290,478, Cl. 164-448.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Papez, Stanislav, 4,290,319, Cl. 74-604.000.

Vollmoeller, Philip K., to United States of America, Air Force. Aircraft ejection seat safetying device. 4,290,568, Cl. 244-122.00A.

von Hagel, Gunter; and Berlenbach, Norbert, to Passavant-Werke. Method and apparatus for mechanically and chemically treating liquids. 4,290,898, Cl. 210-738.000.

Vorwerk, Helmut: *See—*
Muller, Horst; and Vorwerk, Helmut, 4,291,411, Cl. 455-88.000.

Vorys, Nichols. Follicular phase estrogen or progestin with physiologic estrogen/progestin luteal phase replacement drug delivery system. 4,291,028, Cl. 424-238.000.

Vought Corporation: *See—*
Ely, Richard A.; and McClaren, Sherwood W., III, 4,291,080, Cl. 428-116.000.

Vrabel, Edward A.: *See—*
Bennett, Moreland P.; and Vrabel, Edward A., 4,291,215, Cl. 219-118.000.

Vulcan Materials Company: *See—*
Franks, John A., Jr., 4,291,009, Cl. 423-593.000.

Vyatkin, Viktor L.: *See—*
Krasnov, Valery A.; Klovsky, Yakov A.; Dubov, Igor V.; Shtern, Arkady V.; Vyatkin, Viktor L.; and Shavelzon, Lev A., 4,290,665, Cl. 339-276.00T.

W. R. Grace & Co.: *See—*
Boduch, Paul; and Trasavage, Robert, 4,291,118, Cl. 430-313.000.

WABCO Westinghouse: *See—*
Mazzini, Giulio, 4,290,368, Cl. 105-341.000.

Wada, Sakae: *See—*
Koizumi, Masuo; Sasahara, Kazuo; Murakami, Yasushi; Wada, Sakae; Nakakimura, Hiroshi; Kubodera, Noboru; and Hata, Shun-Ichi, 4,290,953, Cl. 260-333.000.

Waddill, John W.; and Pourmand, Bahram, to Rockwell International Corporation. Digital implementation of parity monitor and alarm. 4,291,403, Cl. 371-5.000.

Waggonfabrik Uerdingen A.G.: *See—*
Brause, Joachim; Gerhard, Thomas; Keller, Manfred; and Olszok, Henry, 4,290,367, Cl. 104-105.000.

Waggott, David, to Thermatime A.G. Internally cooled electrode for hyperthermal treatment and method of use. 4,290,435, Cl. 128-800.000.

Wagner, Alfred; and Ames, Adolf, to Swiss Aluminium Ltd. Process for extruding a composite section, a die for this purpose, and the resultant composite section. 4,290,290, Cl. 72-256.000.

Wagner, Gary L., to Ford Aerospace & Communications Corporation. High bandwidth transversal filter. 4,291,286, Cl. 333-166.000.

Wagner, Roger J.: *See—*
Smolik, John V.; Swanson, Ronald V.; Rubin, Charles P.; Blaschke, James C.; and Wagner, Roger J., 4,290,570, Cl. 244-158.00R.

Wagstaff, Nigel, to Shell Oil Company. Process for the preparation of methane and/or ethane. 4,291,188, Cl. 585-752.000.

Wagstaff, Nigel: *See*—
Dautzenberg, Frits M.; and Wagstaff, Nigel, 4,291,182, Cl. 585-415.000.

Wahl, Karl I.; and Lindstrom, Lars G., to Landstingens Inkopscentral, Ekonomisk Forening. Plaster cutting wire, plaster cast or dressing comprising such wire and method of manufacturing such a plaster cast or dressing. 4,290,424, Cl. 128-91.00A.

Wahlig, Helmut; Dingeldein, Elvira; and Braun, Dietrich, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Medicinally useful, shaped mass of collagen resorbable in the body. 4,291,013, Cl. 424-16.000.

Walde, Robert A.: *See*—
Cebalo, Tony; and Walde, Robert A., 4,290,798, Cl. 71-90.000.

Walden, Klaus: *See*—
Sensis, Siegfried; Schwerdtfeger, Joachim; Walden, Klaus; and Ameling, Dieter, 4,290,800, Cl. 75-12.000.

Wallace, James J., to Vacumet Finishing Inc. Coin holder. 4,290,523, Cl. 206-0.820.

Wallace, Joseph E.: *See*—
Pennell, George F.; Silkensen, Ralph D.; and Wallace, Joseph E., 4,291,351, Cl. 360-113.000.

Waller, Arthur, to Bull Dog Lock Co. Metal fastening plate. 4,290,710, Cl. 403-306.000.

Walter, Karl-Heinz, to Siemens Aktiengesellschaft. Electro-optical display device. 4,291,304, Cl. 340-715.000.

Wandl, Rudolf H., to Kurt Vogelsang GmbH. Agitator for cylindrical containes filled with paint or the like. 4,290,706, Cl. 401-4.000.

Wanek, Donald J.: *See*—
King, Francis K.; and Wanek, Donald J., 4,291,350, Cl. 360-104.000.

Wang, Chia-Gee. Methods and apparatus for separating gases with ventilated blades. 4,290,781, Cl. 55-17.000.

Warburton, Charles E., Jr., to Rohm and Haas Company. Non-woven fabrics bonded by radiation-curable, hazard-free binders. 4,291,087, Cl. 428-288.000.

Ward, Peter: *See*—
Cherry, Peter C.; Newall, Christopher E.; Watson, Nigel S.; Gregory, Gordon I.; and Ward, Peter, 4,290,949, Cl. 260-245.300.

Ward, Terence J., to John Wyeth & Brother Limited. Antidepressant piperidine derivatives. 4,291,042, Cl. 424-267.000.

Warner, Frederick L.: *See*—
Fowler, William H.; and Warner, Frederick L., 4,290,361, Cl. 101-182.000.

Warner Lambert Company: *See*—
Werbel, Leslie M., 4,291,034, Cl. 424-250.000.

Warnock, Richard B.; and Briggs, John A., to Fernseh Inc. Noise filter. 4,291,333, Cl. 358-36.000.

Warren, Richard J., to Chrysler Corporation. Wear resistant coated article. 4,290,510, Cl. 188-218.0XL.

Washio, Isomi; and Onishi, Kenji, to Amada Company, Ltd. Bandsaw blade guiding apparatus. 4,290,330, Cl. 83-820.000.

Washitake, Mitsunori: *See*—
Tachi, Yasuhide; Michishita, Kazuhiko; Nakagami, Jozi; Sawada, Jiro; Washitake, Mitsunori; and Kamano, Yoshiaki, 4,290,962, Cl. 260-397.450.

Wasserman, Allan, to Lowenstein, Felice; and Wasserman, Ronnee M., part interest to each. High denier non-plied frieze yarn and method of making the same. 4,290,260, Cl. 57-210.000.

Wasserman, Ronnee M.: *See*—
Wasserman, Allan, 4,290,260, Cl. 57-210.000.

Watanabe, Nobuyoshi: *See*—
Honda, Shoichi; and Watanabe, Nobuyoshi, 4,290,455, Cl. 137-855.000.

Watanabe, Tsutomu: *See*—
Matsudo, Kazuo; Adaniya, Takeshi; Ohmura, Masaru; Shoji, Masahiro; and Watanabe, Tsutomu, 4,290,860, Cl. 204-27.000.

Watson, Nigel S.: *See*—
Cherry, Peter C.; Newall, Christopher E.; Watson, Nigel S.; Gregory, Gordon I.; and Ward, Peter, 4,290,949, Cl. 260-245.300.

Waukesha-Pearce Industries, Inc.: *See*—
Granger, Donald W., 4,290,271, Cl. 62-53.000.

Weaver, James A., to General Foods Corporation. Attachment for fork lift. 4,290,730, Cl. 414-607.000.

Weaver, Ron L. Chlorine gas generator apparatus. 4,290,873, Cl. 204-228.000.

Wedding, Brent M., to Corning Glass Works. Method of making colored photochromic glasses. 4,290,794, Cl. 65-30.110.

Weger, Kenneth F., Jr.: *See*—
Knaack, Howard L.; and Weger, Kenneth F., Jr., 4,290,281, Cl. 70-54.000.

Wehrli, Hans J.; and Roberts, Timothy P., to Kern Instruments, Inc. Photogrammetric plotting apparatus. 4,290,694, Cl. 356-2.000.

Weidenhagen, Dieter; and Schnaebele, Werner, to Messerschmitt-Bolkow-Blohm G.m.b.H. Guided bomb for use in low level flying. 4,290,364, Cl. 102-384.000.

Weimer, Paul K., to RCA Corporation. Architecture line-transfer CCD imagers. 4,291,239, Cl. 307-221.00D.

Weinberg, Aaron; Ebert, Paul M.; Fee, Joseph J.; Kaminsky, Yaroslav; Keblawi, Feisal S.; and Scales, Walter C., to Mitre Corporation, The. Spread spectrum communications method and apparatus. 4,291,409, Cl. 375-1.000.

Weiner, Milton L., to Mobil Oil Corporation. Heat sealable packaging film comprising propylene polymer substrate and a surface layer blend of ethylene copolymer and propylene copolymer. 4,291,092, Cl. 428-349.000.

Welch, David O.: *See*—
Bussiere, Jean F.; Welch, David O.; and Suenaga, Masaki, 4,291,105, Cl. 428-616.000.

Wells, Lowell J.: *See*—
Rupp, Thomas F.; and Wells, Lowell J., 4,290,533, Cl. 215-1.00R.

Wen, Cheng P.; Kuvas, Reidar L.; and Immorlica, Anthony A., Jr., to Rockwell International Corporation. Heterojunction IMPATT diode. 4,291,320, Cl. 357-13.000.

Weng, Tu-Lung: *See*—
Seldin, Emanuel J.; and Weng, Tu-Lung, 4,290,709, Cl. 403-296.000.

Werbel, Leslie M., to Warner Lambert Company. 7-Chloro-3-substituted aryl-3,4-dihydro-1,9(2H,10H) and 10 hydroxy acridinedioneimines having antimalarial activity. 4,291,034, Cl. 424-250.000.

Werner, Heinz: *See*—
Hensel, Wolfgang; Berghof, Hans-Joachim; and Werner, Heinz, 4,290,647, Cl. 297-362.000.

Wernet, William F.: *See*—
Adams, William J.; Wernet, William F.; and Haskins, Steve W., 4,291,202, Cl. 179-103.000.

Wessel, James K.: *See*—
Gordon, David J.; and Wessel, James K., 4,290,896, Cl. 210-710.000.

West, Jeffery L.; and Berry, Randy, to Foster-Miller Associates, Inc. Torque limiter. 4,290,516, Cl. 192-56.00L.

Western Electric Co., Inc.: *See*—
Lawrence, Hopeton S., 4,290,182, Cl. 29-527.400.

Western Geophysical Co. of America: *See*—
Strange, Booth B., 4,290,714, Cl. 405-60.000.

Westinghouse Electric Corp.: *See*—
Bhalla, Ranbir S., 4,291,250, Cl. 313-220.000.
Buchanan, James E.; and Field, Marshall L., Jr., 4,291,387, Cl. 364-757.000.
Buck, Daniel C., 4,291,279, Cl. 330-287.000.
Charles, Larry L., 4,291,370, Cl. 364-200.000.
Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., 4,291,208, Cl. 200-148.00A.
Hanes, Maurice H.; and Schlegel, Earl S., 4,291,329, Cl. 357-64.000.
Harman, Douglas G.; Lambert, Ralph E.; and Gruber, George W., 4,290,303, Cl. 73-105.000.
Kirschbaum, Herbert S., 4,291,233, Cl. 290-1.00C.
Lessmann, Gerald G.; Simpson, Ronald P.; Reichenecker, William J.; and O'Brokta, Ronald D., 4,291,220, Cl. 219-137.00R.
Provine, Daniel J., 4,291,308, Cl. 343-5.0SC.
Seidling, Eugene H.; and Salemi, Nicholas A., 4,291,209, Cl. 200-153.00G.
Wolf, Thomas G., 4,291,375, Cl. 364-483.000.

Wetterskog, Herman E.: *See*—
Casey, Martin J.; Stein, Barry F.; and Wetterskog, Herman E., 4,291,091, Cl. 428-336.000.

Wheeler, Thomas N., to Union Carbide Corporation. Biocidal esters of halo-4-alkenoic acids. 4,291,057, Cl. 424-304.000.

Whirlpool Corporation: *See*—
Braga, Albert T.; Cartier, Roger J.; Getz, Edward H.; and Hafstrom, Warren R., 4,291,238, Cl. 307-141.400.

White, Ronald E.: *See*—
Wright, George C.; and White, Ronald E., 4,291,163, Cl. 546-164.000.

White, Roy L.; Leevers, David F. A.; and Kitchin, Peter W., to Dresser Europe S.A. Fuel-dispensing system with self-checking means. 4,290,538, Cl. 222-25.000.

White, William R.: *See*—
Levine, Stephen A.; and White, William R., 4,290,902, Cl. 252-32.70E.

Whitefield, Rodney J., to International Business Machines Corporation. Plural line acousto-optically modulated laser scanning system. 4,290,672, Cl. 350-358.000.

Whiteley, Desmond, to Fletcher, John, a part interest. Cementitious products. 4,290,750, Cl. 432-106.000.

Whitesides, Michael: *See*—
Hoefer, Peter S.; and Whitesides, Michael, 4,290,871, Cl. 204-180.00G.

Whitmore, Keith E., to Eastman Kodak Company. Additive color imaging using a silverless recording element. 4,291,109, Cl. 430-42.000.

Whitney, Richard P., to Sivyer Steel Corporation. Method of attaching a protective cap to a shredder component. 4,290,545, Cl. 228-139.000.

Whitney, William P., II: *See*—
Kane, William T.; and Whitney, William P., II, 4,290,586, Cl. 266-80.000.

Wicklund, Peter A.: *See*—
Topor, Michael G.; Wicklund, Peter A.; and Ivers, John T., 4,290,989, Cl. 264-142.000.

Wickman Machine Tool Sales Limited: *See*—
McConnell, Edmund A.; Yearsley, Norman; and Blockley, Alec G., 4,290,514, Cl. 192-30.00W.

Widmann, Dietrich: *See*—
Pfleiderer, Hans-Jorg; and Widmann, Dietrich, 4,291,321, Cl. 357-23.000.

Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Prezewowsky, Klaus; Casals-Stenzel, Jorge; and Losert, Wolfgang, to Schering, Aktiengesellschaft. 6β,7β;15,16-Dimethylene-1,4-androstadien-3-ones, their preparation and use as medicinal agents. 4,291,029, Cl. 424-238.000.

Wilcox, Fred F. Clamping device. 4,290,171, Cl. 24-18.000.

Wildenradt, Carl H. Single cylinder deadbolt lock mechanism. 4,290,282, Cl. 70-129.000.

Wilkie, Arnold E., to Monsanto Company. Twisted singles carpet yarn. 4,290,378, Cl. 112-410.000.

Willame, Jean: *See—*
Cappelletto, Renzo; and Willame, Jean, 4,291,379, Cl. 364-506.000.

Williams, Arthur R.; and Williams, Gareth T., to Dunlop Limited. Porous tire tread and method of bonding discrete particles to form same. 4,290,470, Cl. 152-209.00R.

Williams, David R.: *See—*
Tobkes, Martin; Dann, Murray; Klothen, Irving; Spicer, Larry D.; and Williams, David R., 4,291,026, Cl. 424-181.000.

Williams, Emil K.: *See—*
Beynet, Pierre A.; and Williams, Emil K., 4,290,715, Cl. 405-169.000.

Williams, Gareth T.: *See—*
Williams, Arthur R.; and Williams, Gareth T., 4,290,470, Cl. 152-209.00R.

Williams, John B.: *See—*
Moran, George A.; and Williams, John B., 4,290,581, Cl. 251-172.000.

Williams, Robert E.: *See—*
Dyett, Derek H.; Hirsh, Ivan Y.; Preston, Edward G.; and Williams, Robert E., 4,290,518, Cl. 198-450.000.

Wilmshurst, David A.: *See—*
Pierson, James G.; and Wilmshurst, David A., 4,290,473, Cl. 160-120.000.

Wilson, Alexander D.: *See—*
Harris, Richard G.; McRitchie, Allan C.; and Wilson, Alexander D., 4,291,071, Cl. 427-220.000.

Wilson, Charles A., II: *See—*
Mark, Victor; and Wilson, Charles A., II, 4,291,177, Cl. 568-726.000.

Wilson, Denney R. Variable lock differential. 4,290,321, Cl. 74-711.000.

Wilson, Dennis R., to Mostek Corporation. Active refresh circuit for dynamic MOS circuits. 4,291,393, Cl. 365-203.000.

Wilson, Phillip S.: *See—*
Mark, Victor; and Wilson, Phillip S., 4,290,934, Cl. 260-30.80R.

Wilson, R. Marshall; and Rekers, John W., to Research Corporation. 1,5-Dimethyl-6,7-dioxabicyclo[3.2.1]-octane and use to control pine beetles. 4,291,051, Cl. 424-278.000.

Wilson, Walter M.: *See—*
Eccleston, Thomas F.; and Wilson, Walter M., 4,291,192, Cl. 174-11.0BH.

Wing Industries, Inc.: *See—*
Newton, Emerson H., 4,290,789, Cl. 55-269.000.

Wirth, Hermann O.; Bussing, Jurgen; and Friedrich, Hans-Helmut, to Ciba-Geigy Corporation. Pyrrole stabilizers for chlorine-containing thermoplastics. 4,290,940, Cl. 260-45.80N.

Wise, Donald E. Convertible flat/drop trailer. 4,290,642, Cl. 296-182.000.

Wishman, Marvin; Taylor, Peter A.; and Leininger, James C., to Phillips Petroleum Co. Stabilized polyolefin substrate overcoated with an ethoxylated lubricant and a phosphate ester. 4,291,093, Cl. 428-379.000.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-15-hydroxy-prosten-1-ol derivatives. 4,291,174, Cl. 568-330.000.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-11-deoxy-15-hydroxy-prosten-1-ol-derivatives. 4,291,175, Cl. 568-330.000.

Witchger, William J. Electric coil lead attachment means and method. 4,291,292, Cl. 336-192.000.

Witt, Henry J.: *See—*
Cook, Richard B.; and Witt, Henry J., 4,290,911, Cl. 252-316.000.

Witter, Donald R.: *See—*
Nathan, Bernard D.; and Witter, Donald R., 4,291,314, Cl. 346-74.500.

Witzel, Frank: *See—*
Mackay, Donald A. M.; Witzel, Frank; and Linke, Harald A. B., 4,291,045, Cl. 424-270.000.

Wojcik, Bruce C.: *See—*
Baczek, Frank A.; Wojcik, Bruce C.; Jueschke, Alexander A.; Lewis, Daniel M.; Otto, Jack C.; and Tuttle, Lawrence L., 4,290,865, Cl. 204-106.000.

Wolber, Robert; and Obergfell, Walter, to Gebruder Junghans GmbH. Slide switch. 4,291,210, Cl. 200-252.000.

Wolf, Thomas G., to Westinghouse Electric Corp. Portable programmer-reader unit for programmable time registering electric energy meters. 4,291,375, Cl. 364-483.000.

Wolff, Gerard: *See—*
Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,291,032, Cl. 424-248.510.

Wolff, Per L., to Koninklijke Emballage Industrie Van Leer B.V. Foam products from furfuryl alcohol-amino-formaldehyde. 4,291,088, Cl. 428-313.000.

Wolma, Kenneth M.: *See—*
Brown, Kenneth H.; and Wolma, Kenneth M., 4,290,811, Cl. 106-1.170.

Woltersdorf, Otto W., Jr.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 6,7-Disubstituted-2 or 2,2-substituted-5-substituted-1-indanones. 4,291,050, Cl. 424-278.000.

Wood, John C.: *See—*
Morgan, Gordon L.; and Wood, John C., 4,290,348, Cl. 98-115.0SB.

Woodall, Robert M.; Damron, Eugene; and Mick, Martin B., to Exxon Production Research Company. Removal of carbonyl sulfide from liquid hydrocarbon streams. 4,290,879, Cl. 208-232.000.

Woodard, Kenneth E., Jr.: *See—*
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,290,833, Cl. 156-94.000.

Wooster, Kirk A. Apparatus for storing and displaying record albums. 4,290,530, Cl. 211-40.000.

Worm, Manfred: *See—*
Martin, Lawrence L.; and Worm, Manfred, 4,290,958, Cl. 260-346.730.

Worthington, Florence, administratrix: *See—*
Worthington, Ronald L., deceased; and Worthington, Florence, administratrix, 4,290,719, Cl. 409-180.000.

Worthington, Ronald L., deceased; and by Worthington, Florence, administratrix. Cutting guide. 4,290,719, Cl. 409-180.000.

Wright, George C.; and White, Ronald E., to Morton-Norwich Products, Inc. Decahydroquinoline-2-carboxylic acid compounds. 4,291,163, Cl. 546-164.000.

Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., to Cook Paint and Varnish Company. Acrylic resin-acrylic microgel compositions. 4,290,932, Cl. 260-29.6WB.

Wright, Winston F. Sluice construction. 4,290,527, Cl. 209-12.000.

Wulff, Claus: *See—*
Hucks, Uwe; Wulff, Claus; Tresper, Erhard; Vernaleken, Hugo; and Selbeck, Harald, 4,290,977, Cl. 260-973.000.

Wulfing, Johann A.: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,291,037, Cl. 424-253.000.

Wulz, Helmut, to Optilon W. Erich Heilmann GmbH. Slide fastener and method of making same. 4,290,176, Cl. 24-205.16R.

Wuthrich, Paul; and Mascia, Frank, to Timex Corporation. Manual date advance mechanism for a watch. 4,291,397, Cl. 368-35.000.

Wynosky, Thomas A.; Campbell, Charles A.; and Mischke, Robert J., to United Technologies Corporation. Two-dimensional plug nozzle. 4,290,262, Cl. 60-262.000.

Xerox Corporation: *See—*
Lee, Lieng-Huang, 4,291,110, Cl. 430-59.000.
Lu, Chin H., 4,291,111, Cl. 430-107.000.
Lu, Chin H., 4,291,112, Cl. 430-110.000.

Yagi, Toshio: *See—*
Sato, Hideo; and Yagi, Toshio, 4,291,138, Cl. 525-247.000.

Yajima, Tatsuo, to Konishiroku Photo Industry Co., Ltd. Composite recording apparatus for recording information from different information sources. 4,291,341, Cl. 358-300.000.

Yamada, Kazuji; Suzuki, Seiko; Nishihara, Motohisa; Kawakami, Kanji; Sato, Hideo; Kobori, Shigeyuki; Kanzawa, Ryosaku; Takahashi, Minoru; and Minorikawa, Hitoshi, to Hitachi, Ltd. Semiconductor absolute pressure transducer assembly and method. 4,291,293, Cl. 338-4.000.

Yamada, Tsuyoshi, to Showa Denko Kabushiki Kaisha. Method for analyzing acidic substances by high speed liquid chromatography. 4,290,776, Cl. 23-230.00R.

Yamada, Yoji: *See—*
Nishimura, Sadanori; and Yamada, Yoji, 4,290,513, Cl. 192-3.220.

Yamagata University, The President of: *See—*
Morita, Minoru; Sato, Shimio; Hashimoto, Takao; and Kitaoka, Yoji, 4,290,999, Cl. 422-194.000.

Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, to Nippon Soken, Inc. Knock detecting apparatus for internal combustion engine. 4,290,301, Cl. 73-35.000.

Yamaguchi, Hiroaki: *See—*
Hattori, Tadashi; Goto, Kenji; Sawada, Daisaku; Shigematu, Takashi; Yamaguchi, Hiroaki; Nishida, Minoru; and Ito, Teruyoshi, 4,290,398, Cl. 123-425.000.

Yamaguchi, Noboru: *See—*
Mayama, Koichi; Yamaguchi, Noboru; Sugie, Mamoru; Kita, Yuzo; and Yoshizawa, Shigeru, 4,291,241, Cl. 307-269.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Tanaka, Ko, 4,290,501, Cl. 181-228.000.

Yamaki, Kiyoshi: *See—*
Mizote, Masanori; Yamaki, Kiyoshi; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; and Mogi, Takaaki, 4,291,373, Cl. 364-443.000.

Yamamoto Bojin Megane Co., Ltd.: *See—*
Yamamoto, Tamenobu, 4,290,673, Cl. 351-62.000.

Yamamoto, Osamu: *See—*
Sasaki, Shigeo; and Yamamoto, Osamu, 4,290,562, Cl. 242-74.000.
Takenaga, Mutsuo; and Yamamoto, Osamu, 4,290,909, Cl. 252-301.40R.

Yamamoto, Shigehiko: *See—*
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.

Yamamoto, Takaharu: *See—*
Asai, Tsuyoshi; Fujimori, Naoji; and Yamamoto, Takaharu, 4,290,807, Cl. 75-233.000.

Yamamoto, Tamenobu, to Yamamoto Bojin Megane Co., Ltd. Ski goggles. 4,290,673, Cl. 351-62.000.

Yamashita, Kenji: *See—*
Sakano, Kenji; Yamashita, Masahiro; Yamashita, Kenji; and Aketa, Masahiro, 4,290,395, Cl. 123-192.00B.

Yamashita, Masahiro: *See—*
Sakano, Kenji; Yamashita, Masahiro; Yamashita, Kenji; and Aketa, Masahiro, 4,290,395, Cl. 123-192.00B.

Yamauchi, Takashi: *See—*
Maruhashi, Shigeaki; Hasegawa, Morihiro; and Yamauchi, Takashi, 4,290,803, Cl. 75-52.000.

Yamazaki, Hiroshi: *See—*
Kakeno, Sadao; Hayashi, Taisen; Komai, Hiromichi; and Yamazaki, Hiroshi, 4,291,316, Cl. 346-140.00R.

Yamazaki, Isamu: *See—*
Mese, Michihiro; Kashioka, Seiji; Ejiri, Masakazu; Miyatake, Takafumi; Yamazaki, Isamu; and Hamada, Toshimitsu, 4,291,334, Cl. 358-101.000.

Yannoni, Costantino S.: *See—*
Hofer, Donald C.; Kendrick, Raymond D.; and Yannoni, Costantino S., 4,291,272, Cl. 324-313.000.

Yanshin, Ivan S.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Yanshina, Elena S.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Yanshina, Klavdia M.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Yanshina, Zinaida P.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Yarborough, Lyman: *See—*
Sharp, Shelby P.; and Yarborough, Lyman, 4,290,900, Cl. 252-8.55B.

Yarema, Raymond J.; and Studtmann, George H., to Borg-Warner Corporation. Pulse-width modulated inverter system and method. 4,291,368, Cl. 363-41.000.

Yasuda, Hiroshi: *See—*
Kawashima, Kenichi; Yasuda, Hiroshi; and Uema, Kenyu, 4,291,231, Cl. 250-492.00A.

Yasui, Seimei; Sagou, Masakazu; Noguchi, Takanobu; Toyoshima, Yoshiki; and Saito, Junzo, to Sumitomo Chemical Company, Limited. Process for preparation of a phenolic-polybutadiene-HCHO resin composition useful for laminated sheet. 4,291,148, Cl. 528-142.000.

Yasumasa, Sakai: *See—*
Kenji, Fujisawa; Kazuo, Katsube; Tadataka, Yako; Koich, Uemura; Yuichi, Harada; and Yasumasa, Sakai, 4,291,090, Cl. 428-327.000.

Yates, Douglas A.; Hatch, Arthur E.; and Goldsmith, Jeff M., to Mobil Tyco Solar Energy Corporation. Method for crystal growth control. 4,290,835, Cl. 156-601.000.

Yearsley, Norman: *See—*
McConnell, Edmund A.; Yearsley, Norman; and Blockley, Alec G., 4,290,514, Cl. 192-30.00W.

Yeda Research & Development Co. Ltd.: *See—*
Hare, P. Edgar; and Gil-Av, E., 4,290,893, Cl. 210-656.000.

Yissum Research & Development Co. of Hebrew Univ. of Jeru.: *See—*
Baniel, Avraham M., 4,291,007, Cl. 423-390.000.

Yonaga, Yoshifumi, to Maruyoshi Sangyo Kabushiki Kaisha. Remote telephone system. 4,291,197, Cl. 179-2.0EA.

Yoneda, Yushin. Manufacture of rotatable ignition files or flint wheels. 4,290,292, Cl. 72-330.000.

Yoneta, Toshio; Shibahara, Seiji; Seki, Shigeo; and Fukatsu, Shunzo, to Meiji Seika Kaisha, Ltd. Process for the production of 4-aminobutyric acid or its derivatives. 4,290,972, Cl. 260-465.00B.

Yoneyama, Masakazu: *See—*
Minamizono, Junji; Yoneyama, Masakazu; and Sasaki, Jun, 4,291,113, Cl. 430-202.000.

Yoon, Kue H.: *See—*
Cromer, Charles F.; Yoon, Kue H.; Hess, Robert L.; Kelsey, Thomas; and Caithness, Michael G., 4,291,208, Cl. 200-148.00A.

Yoshida, Edward M., to Boeing Company, The. Motor quick-change chuck system for tool having cylindrically shaped adapter portion wherein relative longitudinal movement between chuck and tool being driven is eliminated. 4,290,617, Cl. 279-75.000.

Yoshida Kogyo K. K.: *See—*
Takahashi, Kihei, 4,290,194, Cl. 29-766.000.

Yoshida, Satoshi: *See—*
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,291,119, Cl. 430-348.000.

Yoshida, Syozo: *See—*
Saito, Syuichiro; Uchiyama, Takashi; and Yoshida, Syozo, 4,290,682, Cl. 354-234.000.

Yoshiyuki, Hidetoshi, to Takara Company. Cabinet system. 4,290,659, Cl. 312-224.000.

Yoshizawa, Shigeru: *See—*
Mayama, Koichi; Yamaguchi, Noboru; Sugie, Mamoru; Kita, Yuzo; and Yoshizawa, Shigeru, 4,291,241, Cl. 307-269.000.

Young, Frederick A.; and Griffin, Edward L., to Hughes Aircraft Company. Evanescent mode filter. 4,291,287, Cl. 333-210.000.

Young, Frederick A.; Griffin, Edward L.; and Hendrick, Louis W., to Hughes Aircraft Company. Folded end-coupled general response filter. 4,291,288, Cl. 333-212.000.

Youngstown Sheet and Tube Company: *See—*
DeGeorge, Bernard J.; Hermanson, Dean E.; and Tomas, Carlos, 4,290,463, Cl. 141-387.000.

Yuichi, Harada: *See—*
Kenji, Fujisawa; Kazuo, Katsube; Tadataka, Yako; Koich, Uemura; Yuichi, Harada; and Yasumasa, Sakai, 4,291,090, Cl. 428-327.000.

Yuito, Isamu: *See—*
Aida, Toshiyuki; Yamamoto, Shigehiko; Taguchi, Sadanori; Yuito, Isamu; Honda, Yukio; Kawabe, Ushio; Misumi, Akira; Kawamura, Takao; Fukushima, Hiroshi; and Degawa, Yoshio, 4,291,252, Cl. 313-346.00R.

Yun, Sun Y. Padlock. 4,290,280, Cl. 70-38.00A.

Yusa, Hideo: *See—*
Horiuchi, Susumu; Hirano, Mikio; Yusa, Hideo; Chino, Koichi; and Hayashi, Tatsuo, 4,290,907, Cl. 252-301.10W.
Horiuchi, Susumu; Taniguchi, Takashi; Takeshima, Masaki; Hirano, Mikio; and Yusa, Hideo, 4,290,908, Cl. 252-301.10W.

Zagorova, Maria S.: *See—*
Vlahov, Radoslav Y.; Krikoryan, Dikran A.; Zagorova, Maria S.; Ninova, Maya H.; and Parushev, Stoyan P., 4,290,862, Cl. 204-59.00R.

Zahnradfabrik Friedrichshafen, AG.: *See—*
Liebert, Karl-Heinz; and Tischer, Werner, 4,290,738, Cl. 418-61.00B.

Zaroor, Shlomo. Hand-utensil particularly useful for removing the peel of citrus fruit. 4,290,197, Cl. 30-123.700.

Zassinovich, Grazia: *See—*
Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,290,961, Cl. 260-397.400.

Zedekar, Stanley L.: *See—*
Noar, Raymond; Zedekar, Stanley L.; Albertson, Michael D.; Pointer, Carl W.; Gall, Chester E.; and Fuller, Alfred B., 4,290,316, Cl. 74-5.460.

Zeigler, Theodore R. Collapsible self-supporting structures and panels and hub therefor. 4,290,244, Cl. 52-80.000.

Zens, John F.: *See—*
Cumming, Richard J.; DeBano, John; Mertz, Harold J., Jr.; Nordeen, Donald L.; Sajewski, Vincent F.; and Zens, John F., 4,290,627, Cl. 280-729.000.

Zepp, Charles M.: *See—*
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,290,951, Cl. 260-326.12R.

Ziegler, Franz: *See—*
Ludemann, Heinz; and Ziegler, Franz, 4,290,594, Cl. 271-180.000.

Zimmer, Ernst, to Industriewerke Karlsruhe Augsburg AG Zweigniederlassung Keller & Knappich. Tool positioner. 4,290,239, Cl. 51-126.000.

Zindler, Hugh A. Clutch and brake mechanism. 4,290,512, Cl. 192-1.000.

Ziniades, Emmanuel J. Method and apparatus for providing optimum fuel-to-air ratio for internal combustion engine. 4,290,403, Cl. 123-568.000.

Zinke, Horst; Lorenz, Hans J.; and Linhart, Helmut, to Ciba-Geigy Corporation. Stabilization systems from triarylphosphites and phenols. 4,290,941, Cl. 260-45.85B.

Zobel, Henry F.; and Maxwell, James L., to CPC International Inc. Staling resistant baked food product. 4,291,065, Cl. 426-549.000.

Zubkov, Vladimir M.: *See—*
Kolchin, Anatoly V.; Veprintsev, Vladimir I.; Klyachko, Lev I.; Novgorodov, Alexandr S.; Zubkov, Vladimir M.; Vereschagin, Leonid F.; Khvostantsev, Lev G.; Novikov, Albert P.; Yanshina, Klavdia M.; Yanshina, Elena S.; Yanshin, Ivan S.; and Yanshina, Zinaida P., 4,290,741, Cl. 425-77.000.

Zubryckyj, Nicolaus: *See—*
Bolton, Gerald L.; Sefton, Verner B.; and Zubryckyj, Nicolaus, 4,290,866, Cl. 204-119.000.

Zwosta, Helge: *See—*
Kobler, Ingo; Mamberer, Hans; and Zwosta, Helge, 4,290,362, Cl. 101-350.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Belgium Tool & Die Company: *See*—
Stroobants, Alphonse; and Cvacho, Daniel S., Re. 30,746, Cl. 82-56.000.

Chambless, Leo B., to General Electric Company. Reverse cycle heat pump circuit. Re. 30,745, Cl. 62-324.100.

Cvacho, Daniel S.: *See*—
Stroobants, Alphonse; and Cvacho, Daniel S., Re. 30,746, Cl. 82-56.000.

Dierichs, Wolfgang: *See*—
Muszik, Janos A.; and Dierichs, Wolfgang, Re. 30,747, Cl. 260-22.00R.

General Electric Company: *See*—
Chambless, Leo B., Re. 30,745, Cl. 62-324.100.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Muszik, Janos A.; and Dierichs, Wolfgang, Re. 30,747, Cl. 260-22.00R.

Muszik, Janos A.; and Dierichs, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Adhesive applicator crayons. Re. 30,747, Cl. 260-22.00R.

Sears, Barry D. Sphatidyl quaternary ammonium compounds. Re. 30,748, Cl. 2 403.000.

Stroobants, Alphonse; and Cvacho, Daniel S., to Belgium Tool & Die Company. Can cutting apparatus and method. Re. 30,746, Cl. 82-56.000.

LIST OF DESIGN PATENTEES

Anderson, Edward C. Toy whirler or similar article. 260,911, 9-22-81, Cl. D21-92.000.

Answerex, Inc.: *See*—
McCain, Lawrence G., 260,882, Cl. D14-12.000.

Appel, Mel; Means, Paul B., III; Wilcox, James J.; and Reina, David W., to Appel, Mel. Toy safe. 260,912, 9-22-81, Cl. D21-122.000.

Asher, James C.: *See*—
McKinsey, Kevin P.; and Asher, James C., 260,881, Cl. D14-11.000.

Atari, Inc.: *See*—
McKinsey, Kevin P.; and Asher, James C., 260,881, Cl. D14-11.000.

Avramovich, Radosav, to Daniel Woodhead, Inc. Electrical connector housing. 260,879, 9-22-81, Cl. D13-28.000.

B. F. Goodrich Company, The: *See*—
Wright, David A.; and Strauts, Maija V., 260,872, Cl. D12-146.000.

Ball Corporation: *See*—
Friebel, Virgil R., 260,845, Cl. D32-40.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Schneider, Louis; and Muth, Hans A., 260,821, Cl. D3-71.000.

Bell & Howell Company: *See*—
Overman, John W., 260,903, Cl. D16-27.000.

Bentley, William F.: *See*—
Luedtke, Arthur; and Bentley, William F., 260,895, Cl. D14-86.000.

Biederman, Irving. Pneumatic orbital polisher. 260,847, 9-22-81, Cl. D8-62.000.

Binney & Smith: *See*—
Lieberman, Sheldon, 260,840, Cl. D7-22.000.

Bofors America, Inc.: *See*—
Spoor, Martin, 260,880, Cl. D13-99.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Kao, Tonis, 260,900, Cl. D32-22.000.
Reichl, Ernst, 260,933, Cl. D24-62.000.

Boukma, John, to Howard Miller Clock Company. Grandfather clock with mirrored movement. 260,859, 9-22-81, Cl. D10-16.000.

Broyhill Furniture Industries, Inc.: *See*—
Smith, Melbourne F., Jr., 260,835, Cl. D6-172.000.

Burnham, Geoffrey: *See*—
Laird, Richard A.; and Burnham, Geoffrey, 260,843, Cl. D7-77.000.

Burr, John F.: *See*—
Dolinar, Kevin D.; and Burr, John F., 260,878, Cl. D13-13.000.

Cargile, W. Allen. Automobile. 260,871, 9-22-81, Cl. D12-85.000.

Casey, Eugene J., Jr.: *See*—
Chieda, Robert; Johnson, Robert W.; Smith, Douglas W.; and Casey, Eugene J., Jr., 260,898, Cl. D15-12.000.

Chapman, Anthony C. B., to Lotus Cars Limited. Model racing car. 260,913, 9-22-81, Cl. D21-137.000.

Chaskin, Harold. Flag. 260,868, 9-22-81, Cl. D11-180.000.

Chaskin, Harold. Flag. 260,869, 9-22-81, Cl. D11-180.000.

Chaskin, Harold. Flag. 260,870, 9-22-81, Cl. D11-180.000.

Chieda, Robert; Johnson, Robert W.; Smith, Douglas W.; and Casey, Eugene J., Jr., to Toro Company, The. Snow thrower housing. 260,898, 9-22-81, Cl. D15-12.000.

Chodorow, Ingram S.; and Hall, Richard, to Technalytics, Inc. Nasogastric tube stabilizer. 260,932, 9-22-81, Cl. D24-53.000.

Clarence Controls Inc.: *See*—
Pershyn, Robert S., 260,876, Cl. D13-4.000.
Scott, Brent E.; and Pershyn, Robert S., 260,877, Cl. D13-4.000.

Computer Roomers: *See*—
Verdesca, Sandra R.; and Verdesca, Joseph T., 260,832, Cl. D6-132.000.

Consolidation Coal Company: *See*—
Dolinar, Kevin D.; and Burr, John F., 260,878, Cl. D13-13.000.

Conti, Rino, to Dart Industries Inc. Cover for a food container. 260,844, 9-22-81, Cl. D7-131.000.

Cope, James R. Fishing lure. 260,923, 9-22-81, Cl. D22-28.000.

Cordray, Paul; and Seidler, Migdonio. Toilet tissue holder. 260,828, 9-22-81, Cl. D6-97.000.

Courreges, Andre. Combined bottle and cap. 260,858, 9-22-81, Cl. D9-386.000.

Covey, Laird F.: *See*—
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Creamer, Joan K., to Dart Industries Inc. Key rack or the like. 260,829, 9-22-81, Cl. D6-114.000.

CTM Computertechnik Muller GmbH: *See*—
Esslinger, Hartmut; Haug, Andreas; and Spreng, Georg, 260,887, Cl. D14-106.000.

Daniel Woodhead, Inc.: *See*—
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Dart Industries Inc.: *See*—
Conti, Rino, 260,844, Cl. D7-131.000.
Creamer, Joan K., 260,829, Cl. D6-114.000.
Trombly, Edgar F., 260,842, Cl. D7-64.000.

Day, Maxwell W. Tent. 260,922, 9-22-81, Cl. D21-253.000.

DeLuca, James M. Racket ball holder. 260,919, 9-22-81, Cl. D21-206.000.

de Polo, Lydia; and Dunbar, Jack G., to General Mills, Inc. Desk or similar article. 260,833, 9-22-81, Cl. D6-161.000.

de Polo, Lydia; and Dunbar, Jack G., to General Mills, Inc. Table or similar article. 260,836, 9-22-81, Cl. D6-177.000.

Dolinar, Kevin D.; and Burr, John F., to Consolidation Coal Company. Junction box. 260,878, 9-22-81, Cl. D13-13.000.

Dolly Toy Company, The: *See*—
Holtvoigt, John H., 260,940, Cl. D26-97.000.

Doman, Theodore L. Parking guide. 260,860, 9-22-81, Cl. D10-110.000.

Drackett Company, The: *See*—
Dusek, Russell L., 260,926, Cl. D23-150.000.
Pardo, John, 260,857, Cl. D9-376.000.

Dresser Industries, Inc.: *See*—
Todd, John A., 260,897, Cl. D15-9.200.

Dunbar, Jack G.: *See*—
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de Polo, Lydia; and Dunbar, Jack G., 260,836, Cl. D6-177.000.

Durand, Jean-Jacques. Tumbler or similar article. 260,839, 9-22-81, Cl. D7-14.000.

Dusek, Russell L., to Drackett Company, The. Dispenser for air treating material. 260,926, 9-22-81, Cl. D23-150.000.

Ellermeier, Konrad, to U.S. Philips Corporation. Television camera. 260,894, 9-22-81, Cl. D14-78.000.

Esslinger, Hartmut; Haug, Andreas; and Spreng, Georg, to CTM Computertechnik Muller GmbH. Display screen-terminal. 260,887, 9-22-81, Cl. D14-106.000.

Evans, Homer E. Figurine or similar article. 260,867, 9-22-81, Cl. D11-160.000.

FIG. 1 is a perspective view of a game board, , showing my new design in a playing position: *See*—
Richards, M. David; and FIG. 1 is a perspective view of a game board, , showing my new design in a playing position, 260,909, Cl. D21-15.000.

Figur, Bernd, to Rowenta-Werke, GmbH. Lighter. 260,941, 9-22-81, Cl. D27-36.000.

Figur, Bernd: *See*—
Stutzer, Franz A.; and Figur, Bernd, 260,943, Cl. D27-42.000.

Fink, David, to Windsor Industries, Inc. Portable radio. 260,891, 9-22-81, Cl. D14-70.000.
FMC Corporation: *See—*
Joseph, George L.; and Travinski, George A., 260,899, Cl. D15-28.000.
Friebel, Virgil R., to Ball Corporation. Record brush or similar article. 260,845, 9-22-81, Cl. D32-40.000.
General Mills, Inc.: *See—*
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de Polo, Lydia; and Dunbar, Jack G., 260,836, Cl. D6-177.000.
Gillette Company, The: *See—*
Gray, Michael J., 260,944, Cl. D28-46.000.
Gilmore, Nancy K. Bologna cutter. 260,841, 9-22-81, Cl. D7-43.000.
Giulie, James E.; and Giulie, Joe D. Desk tray. 260,907, 9-22-81, Cl. D19-92.000.
Giulie, Joe D.: *See—*
Giulie, James E.; and Giulie, Joe D., 260,907, Cl. D19-92.000.
Glenn, Edward C. Dowell pin positioner. 260,927, 9-22-81, Cl. D24-10.000.
Gray, Michael J., to Gillette Company, The. Razor. 260,944, 9-22-81, Cl. D28-46.000.
Green, Stephanie J. Artificial Christmas garniture. 260,863, 9-22-81, Cl. D11-121.000.
Greenblatt, Gordon M. Medical flexible tube support. 260,850, 9-22-81, Cl. D8-356.000.
Grusing, Dale E. Combined desk tray, calendar pad holder and desk set. 260,906, 9-22-81, Cl. D19-77.000.
Gueret, Jean-Louis H., to L'Institut Jeanne Piaubert. Body massager. 260,928, 9-22-81, Cl. D24-36.000.
Hall, Richard: *See—*
Chodorow, Ingram S.; and Hall, Richard, 260,932, Cl. D24-53.000.
Haller, John L. Rectangular slide spa. 260,929, 9-22-81, Cl. D24-38.000.
Han, Sang W. Barrel-shaped pendant. 260,861, 9-22-81, Cl. D11-79.000.
Haug, Andreas: *See—*
Esslinger, Hartmut; Haug, Andreas; and Spreng, Georg, 260,887, Cl. D14-106.000.
Hemeyer, Arley C., to Unique Products. Set of vice blocks. 260,848, 9-22-81, Cl. D8-71.000.
Hetrick, Vernon L., to Meyer, Products, Inc. Auxiliary light for vehicle having attached plow blade. 260,937, 9-22-81, Cl. D26-35.000.
Hobson, Haydn H. Corner guard. 260,855, 9-22-81, Cl. D8-403.000.
Holtvoigt, John H., to Dolly Toy Company, The. Decorative lamp. 260,940, 9-22-81, Cl. D26-97.000.
Hotchkiss, John E. Tool holder. 260,831, 9-22-81, Cl. D6-130.000.
Howard Miller Clock Company: *See—*
Boukma, John, 260,859, Cl. D10-16.000.
Hurray, Michael E. Sink. 260,924, 9-22-81, Cl. D23-58.000.
Husted, Martin D., to MSI Data Corporation. Variable keyboard for computer terminal, or the like. 260,883, 9-22-81, Cl. D14-115.000.
Ikeda, Matafumi, to Sharp Corporation. Combined electronic calculating machine and timepiece. 260,904, 9-22-81, Cl. D18-7.000.
Jack Daniel Distillery, Lem Motlow, Prop., Inc.: *See—*
Redmond, Jobie G., 260,825, Cl. D6-60.000.
Johnson, Craig A. Foot control for an electric golf car or the like. 260,873, 9-22-81, Cl. D12-174.000.
Johnson, Robert W.: *See—*
Chieda, Robert; Johnson, Robert W.; Smith, Douglas W.; and Casey, Eugene J., Jr., 260,898, Cl. D15-12.000.
Jones, Georgia A. Stuffed toy. 260,914, 9-22-81, Cl. D21-148.000.
Jones, William C. Spirometric computer. 260,885, 9-22-81, Cl. D14-106.000.
Joseph, George L.; and Travinski, George A., to FMC Corporation. Vehicle track shoe. 260,899, 9-22-81, Cl. D15-28.000.
Kao, Tonis, to Bosch-Siemens Hausgerate GmbH. Vacuum cleaner. 260,900, 9-22-81, Cl. D32-22.000.
Kato, Seiichi. Blind. 260,838, 9-22-81, Cl. D6-205.000.
Kato, Yuji, to Tomy Kogyo Co., Inc. Pinball game housing for preschool age children. 260,820, 9-22-81, Cl. D2-7.000.
Ketcham & McDougall, Inc.: *See—*
Macowski, William, 260,908, Cl. D19-95.000.
Kjell Folke Ohlson: *See—*
Strand, Hans E., 260,936, Cl. D26-28.000.
Klaber, Michael C. Foldable pen. 260,905, 9-22-81, Cl. D19-41.000.
Kurozumi, Shigeru, to Sharp Corporation. Electrostatic copying machine. 260,902, 9-22-81, Cl. D16-27.000.
Laird, Richard A.; and Burnham, Geoffrey. Insulated holder for beverage cans or the like. 260,843, 9-22-81, Cl. D7-77.000.
Langan, Allen W.: *See—*
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Levin, Gary M. Railroad restaurant. 260,934, 9-22-81, Cl. D25-11.000.
Lieberman, Sheldon, to Binney & Smith. Display plate having a removable template. 260,840, 9-22-81, Cl. D7-22.000.
L'Institut Jeanne Piaubert: *See—*
Gueret, Jean-Louis H., 260,928, Cl. D24-36.000.
Linzer, Jesse O. Jewel setting crown or the like. 260,862, 9-22-81, Cl. D11-92.000.
Litton Business Systems, Inc.: *See—*
Platner, Warren, 260,834, Cl. D6-161.000.
Loeschen, Lester L. Shelf bracket. 260,852, 9-22-81, Cl. D8-381.000.
Lotus Cars Limited: *See—*
Chapman, Anthony C. B., 260,913, Cl. D21-137.000.
Luedtke, Arthur; and Bentley, William F., to United States of America, America as represented by Field Operations Bureau Office, FCC. Directional annular slot antenna. 260,895, 9-22-81, Cl. D14-86.000.
Macowski, William, to Ketcham & McDougall, Inc. Combined desk pad and pen assemblies. 260,908, 9-22-81, Cl. D19-95.000.
Marchessault, Fernand. Curling broom. 260,920, 9-22-81, Cl. D21-211.000.
Marlin Fiberglass, Inc.: *See—*
Reineman, Richard G., 260,931, Cl. D24-38.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
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McCain, Lawrence G., to Answerex, Inc. Microphone. 260,882, 9-22-81, Cl. D14-12.000.
McKinsey, Kevin P.; and Asher, James C., to Atari, Inc. Memory module housing. 260,881, 9-22-81, Cl. D14-11.000.
McLean, James D.; and Snider, David E. Touch-pad for a telephone. 260,889, 9-22-81, Cl. D14-66.000.
Means, Paul B., III: *See—*
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Meis, William J. Chain anchor for a concrete floor or the like. 260,853, 9-22-81, Cl. D8-385.000.
Mena, Pedro B. Racquet swing weight device. 260,921, 9-22-81, Cl. D21-212.000.
Metz, Thomas V.; and Sirois, W. James, to Pacific Fireplace Furnishings, Inc. Casting for fireplace heat exchanger. 260,925, 9-22-81, Cl. D23-127.000.
Meyer, Products, Inc.: *See—*
Hetrick, Vernon L., 260,937, Cl. D26-35.000.
Mishiro, Benito: *See—*
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Luedtke, Arthur; and Bentley, William F., 260,895, Cl. D14-86.000.
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ISSUED SEPTEMBER 22, 1981

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228 4,290,501

CLASS 182

33 4,290,502
47 4,290,503
187 4,290,504

CLASS 188

18 A 4,290,505
24.15 4,290,507
24.19 4,290,506
73.38 4,290,508
181 A 4,290,509
218 XL 4,290,510
322.17 4,290,511

CLASS 192

1 4,290,512
3.22 4,290,513
30 W 4,290,514
53 C 4,290,515
56 L 4,290,516

CLASS 198

427 4,290,517
450 4,290,518
483 4,290,519
499 4,290,520

CLASS 200

19 R 4,291,206
42 R 4,291,207
148 A 4,291,208
153 G 4,291,209
252 4,291,210
311 4,291,211
331 4,291,212
335 4,291,213

CLASS 201

26 4,290,854

CLASS 204

1.5 4,290,855
4 4,290,856
9 4,290,857
12 4,290,858
16 4,290,859
27 4,290,860
56 R 4,290,861
59 R 4,290,862
99 4,290,863
103 4,290,864
106 4,290,865
119 4,290,866
129.35 4,290,867
148 4,290,868
159.13 4,290,869
159.15 4,290,870
180 G 4,290,871
195 F 4,290,872
228 4,290,873
243 R 4,290,874
298 4,290,875
4,290,876
4,290,877

CLASS 206

0.5 4,290,521
0.82 4,290,523
5 4,290,522
232 4,290,524
427 4,290,525
624 4,290,526

CLASS 208

120 4,290,878
232 4,290,879
309 4,290,880
310 R 4,290,881

CLASS 209

12 4,290,527
223 R 4,290,528

CLASS 210

169 4,290,883
195.3 4,290,884
197 4,290,885
219 4,290,886
242.1 4,290,887
356 4,290,888
484 4,290,889
608 4,290,890
611 4,290,891
634 4,290,882
656 4,290,892
4,290,893
661 4,290,894
669 4,290,895
710 4,290,896
4,290,897
738 4,290,898

CLASS 211

13 4,290,529
40 4,290,530
71 4,290,531
200 4,290,532

CLASS 215

1 R 4,290,533
247 4,290,534
270 4,290,535

CLASS 219

86.1 4,291,214
118 4,291,215
4,291,216
121 EC 4,291,218
121 EY 4,291,219
121 PH 4,291,217
137 R 4,291,220

CLASS 220

359 4,290,536

CLASS 222

25 4,290,537
4,290,538

CLASS 223

118 4,290,539

CLASS 224

314 4,290,540

CLASS 226

150 4,290,541

CLASS 227

155 4,290,542

CLASS 228

2.5 4,290,543
7 4,290,544
139 4,290,545

CLASS 229

43 4,290,546
77 4,290,547

CLASS 232

24 4,290,548
35 4,290,549

CLASS 233

26 4,290,550

CLASS 235

92 CC 4,291,221
380 4,291,222

CLASS 236

1 G 4,290,552
9 R 4,290,551
42 4,290,553
49 4,290,554

CLASS 239

8 4,290,555
177 4,290,556
222.21 4,290,557
400 4,290,558
716 4,290,559

CLASS 241

65 4,290,560

CLASS 242

55 4,290,561
74 4,290,562
78.6 4,290,563
107 4,290,564
152.1 4,290,565
189 4,290,566
198 4,290,567

CLASS 244

122 A 4,290,568
129.4 4,290,569
158 R 4,290,570

CLASS 248

59 4,290,571
74 B 4,290,572
152 4,290,573
177 4,290,574
316 D 4,290,575

CLASS 249

20 4,290,576

CLASS 250

201 4,291,223
204 4,291,224
229 4,291,225
324 4,291,226
328 4,291,227
363 S 4,291,228
451 4,291,229
458 4,291,230
492 A 4,291,231

CLASS 251

1 A 4,290,577
63 4,290,578
139 4,290,579
169 4,290,580
172 4,290,581

CLASS 252

8.5 A 4,290,899
8.55 B 4,290,900
8.55 C 4,290,901
32.7 E 4,290,902
56 S 4,290,925
91 4,290,903
118 4,290,904
299.63 4,290,905
301.1 W 4,290,906
4,290,907
4,290,908
301.4 R 4,290,909
312 4,290,910
316 4,290,911
389 R 4,290,912
428 4,290,913
4,290,914
429 B 4,290,915
430 4,290,916
4,290,917
431 R 4,290,918
437 4,290,919
439 4,290,920
441 4,290,921
456 4,290,922
462 4,290,923
469 4,290,924
579 4,290,926

CLASS 254

15 4,290,582
26 R 4,290,583
380 4,290,584

CLASS 256

13.1 4,290,585

CLASS 260

3 4,290,927
22 R Re.30,747
28 P 4,290,928
29.2 N 4,290,929
29.6 MM 4,290,933
29.6 MP 4,290,930
29.6 RW 4,290,931
29.6 WB 4,290,932
30.8 R 4,290,934
32.6 NA 4,290,935
33.4 P 4,290,936
40 R 4,290,937
4,290,938
4,290,939
45.8 N 4,290,940
45.85 B 4,290,941
45.85 H 4,290,942
112.5 R 4,290,943
4,290,944
192 4,290,945
239 A 4,290,947
239 B 4,290,946
245.2 R 4,290,948
245.3 4,290,949
326.12 R 4,290,950
4,290,951
326.47 4,290,952
333 4,290,953
335 4,290,954
336 4,290,955
338 4,290,956
345.2 4,290,957
346.73 4,290,958
348.24 4,290,959
348.57 4,290,960
397.4 4,290,961
397.45 4,290,962
4,290,963
403 Re.30,748
404 4,290,964
408 4,290,965
413 4,290,966
429 R 4,290,967
453 AB 4,290,969
453 P 4,290,968
4,290,970
453.5 4,290,971
465 B 4,290,972
505 R 4,290,973
511 4,290,974
513.6 4,290,975
973 4,290,976
4,290,977
4,290,978

CLASS 261

4 4,290,979
94 4,290,980
114 VT 4,290,981
124 4,290,982

CLASS 264

22 4,290,983
30 4,290,984
31 4,290,985
40.3 4,290,986
41 4,290,987
112 4,290,988
142 4,290,989
156 4,290,990
157 4,290,991
163 4,290,992
164 4,290,993
515 4,290,994
532 4,290,995
564 4,290,996

CLASS 266

80 4,290,586
191 4,290,587
225 4,290,588
4,290,590
236 4,290,589

CLASS 269

6 4,290,591

CLASS 270

40 4,290,592

CLASS 271

42 4,290,593
180 4,290,594
277 4,290,595
292 4,290,596

CLASS 272

117 4,290,597
4,290,598
130 4,290,599
137 4,290,600
146 4,290,601

CLASS 273

29 R 4,290,602
34 A 4,290,603
73 G 4,290,604
110 4,290,605
128 R 4,290,606
239 4,290,607
256 4,290,608

CLASS 277

3 4,290,609
13 4,290,610
27 4,290,611
81 R 4,290,612
96.1 4,290,613
205 4,290,614
221 4,290,615
235 B 4,290,616

CLASS 279

75 4,290,617

CLASS 280

5.22 4,290,618
154.5 R 4,290,619
209 4,290,620
216 4,290,621
400 4,290,622
4,290,623
634 4,290,624
654 4,290,625
692 4,290,626
729 4,290,627
803 4,290,628
806 4,290,629

CLASS 283

8 R 4,290,630

CLASS 285

137 A 4,290,631
323 4,290,632

CLASS 290

1 C 4,291,233
1 R 4,291,232
53 4,291,234
55 4,291,235

CLASS 292

114 4,290,633
201 4,290,634
290 4,290,635
338 4,290,636

CLASS 294

83 A 4,290,637
89 4,290,638

CLASS 296

1 S 4,290,639
95 R 4,290,640
146 4,290,641
182 4,290,642

CLASS 297

16 4,290,643
195 4,290,644
239 4,290,645
327 4,290,646
362 4,290,647

CLASS 299

1 4,290,648
2 4,290,649
4 4,290,650
7 4,290,651
45 4,290,652
87 4,290,653

CLASS 301

9 TV 4,290,654

CLASS 307

10 AT 4,291,237
40 4,291,236
141.4 4,291,238
221 D 4,291,239
262 4,291,240
269 4,291,241
270 4,291,242
304 4,291,243
400 4,291,244
4,291,245
475 4,291,246
481 4,291,247

CLASS 308

121 4,290,655
4,290,656

CLASS 310

14 4,291,248
214 4,291,249

CLASS 312

21 4,290,657
108 4,290,658
224 4,290,659
253 4,290,660

CLASS 313

220 4,291,250
346 R 4,291,252
348 4,291,253
413 4,291,251

CLASS 315

240 4,291,254
340 4,291,255
368 4,291,256
408 4,291,257

CLASS 318

124 4,291,258
139 4,291,259
331 4,291,260
482 4,291,261
603 4,291,262
706 4,291,263
729 4,291,264
782 4,291,265

CLASS 320

2 4,291,266

CLASS 324

54 4,291,267
76 R 4,291,268
79 D 4,291,269
230 4,291,270
307 4,291,271
313 4,291,272
343 4,291,273

CLASS 328

133 4,291,274

CLASS 329

112 4,291,275

CLASS 330

85 4,291,276
149 4,291,277
286 4,291,278
287 4,291,279

CLASS 331

65 4,291,280
94.5 C 4,291,281
94.5 S 4,291,282
96 4,291,283

CLASS 333

17 M 4,291,284
150 4,291,285
166 4,291,286
210 4,291,287
212 4,291,288
240 4,291,289

CLASS 334

1 4,291,290

CLASS 335

191 4,291,291

CLASS 336

192 4,291,292

CLASS 338

4 4,291,293

CLASS 339

18 R 4,290,661
89 M 4,290,662
143 R 4,290,663
156 R 4,290,664
276 T 4,290,665

CLASS 340

26 4,291,294
53 4,291,295
64 4,291,296

347 AD 4,291,297
4,291,298
4,291,299
4,291,300
568 4,291,301
642 4,291,302
711 4,291,303
715 4,291,304
734 4,291,305
744 4,291,306
756 4,291,307

CLASS 343

5 SC 4,291,308
7.5 4,291,309
16 R 4,291,310
700 MS 4,291,311
4,291,312

CLASS 346

68 4,291,313
74.5 4,291,314
76 R 4,291,315
140 R 4,291,316
4,291,317

CLASS 350

85 4,290,666
96.18 4,290,667
96.20 4,290,668
174 4,290,669
274 4,290,670
317 4,290,671
358 4,290,672

CLASS 351

62 4,290,673

CLASS 354

38 4,290,674
112 4,290,675
121 4,290,676
127 4,290,677
128 4,290,678
196 4,290,679
203 4,290,680
230 4,290,681
234 4,290,682
4,290,683
266 4,290,685
286 4,290,684
289 4,290,686
320 4,290,687

CLASS 355

1 4,290,688
4,290,689
3 FU 4,290,691
3 R 4,290,690
69 4,290,692

CLASS 356

1 4,290,693
2 4,290,694
73 4,290,695
300 4,290,696
350 4,290,697
371 4,290,698
420 4,290,699

CLASS 357

2 4,291,318
13 4,291,319
4,291,320
23 4,291,321
4,291,322
30 4,291,323
36 4,291,324
38 4,291,325
51 4,291,326
52 4,291,327
59 4,291,328
64 4,291,329

CLASS 358

8 4,291,330
13 4,291,331
19 4,291,332
36 4,291,333
101 4,291,334
154 4,291,335
160 4,291,336
213 4,291,337
228 4,291,338
260 4,291,339
296 4,291,340
300 4,291,341

CLASS 360

12 4,291,342
30 4,291,343
36 4,291,344
62 4,291,345
75 4,291,346
93 4,291,347
96.4 4,291,348
98 4,291,349
104 4,291,350
113 4,291,351
121 4,291,352
128 4,291,353
129 4,291,354

CLASS 361

31 4,291,355
87 4,291,356
101 4,291,357
154 4,291,358
173 4,291,359
189 4,291,360
293 4,291,361
302 4,291,362
333 4,291,363
384 4,291,364

CLASS 362

281 4,291,365

CLASS 363

17 4,291,366
21 4,291,367
41 4,291,368
60 4,291,369

CLASS 364

200 4,291,370
4,291,371
4,291,372
443 4,291,373
466 4,291,374
483 4,291,375
4,291,376
4,291,377
494 4,291,378
506 4,291,379
522 4,291,380
551 4,291,382
4,291,383
560 4,291,384
709 4,291,385
717 4,291,386
757 4,291,387
900 4,291,388

CLASS 365

15 4,291,389
183 4,291,390
184 4,291,391
203 4,291,392
4,291,393
206 4,291,394
523 4,291,381

CLASS 366

76 4,290,700
77 4,290,701
4,290,702
345 4,290,703

CLASS 367

83 4,291,395
154 4,291,396

CLASS 368

35 4,291,397
37 4,291,398
82 4,291,399
84 4,291,400
236 4,291,401
276 4,291,402

CLASS 371

5 4,291,403
20 4,291,404
31 4,291,405
44 4,291,406
49 4,291,407
4,291,408

CLASS 375

1 4,291,409
4,291,410

CLASS 400

248 4,290,704
618 4,290,705

CLASS 401

4 4,290,706
110 4,290,707

CLASS 403

24 4,290,708
296 4,290,709
306 4,290,710
358 4,290,711

CLASS 404

10 4,290,712
69 4,290,713

CLASS 405

60 4,290,714
169 4,290,715
203 4,290,716

CLASS 408

241 G 4,290,717

CLASS 409

8 4,290,718
180 4,290,719
233 4,290,720
234 4,290,721

CLASS 411

2 4,290,337
4,290,338
185 4,290,469

CLASS 414

48 4,290,722
83 4,290,723
251 4,290,724
329 4,290,725
421 4,290,726
476 4,290,733
508 4,290,727
537 4,290,728
607 4,290,729
4,290,730
678 4,290,731
752 4,290,732
786 4,290,734

CLASS 417

2 4,290,735
87 4,290,736
403 4,290,737

CLASS 418

61 B 4,290,738
189 4,290,739

CLASS 422

73 4,290,997
193 4,290,998
194 4,290,999

CLASS 423

53 4,291,000
179.5 4,291,001
189 4,291,002
228 4,291,003
242 4,291,004
321 R 4,291,005
359 4,291,006
390 4,291,007
461 4,291,008
593 4,291,009
594 4,291,010
625 4,291,011

CLASS 424

1 4,291,012
16 4,291,013
28 4,291,014
4,291,015
35 4,291,016
52 4,291,017
64 4,291,018
89 4,291,019
4,291,020
121 4,291,021
177 4,291,022
180 4,291,023
4,291,024
4,291,025
181 4,291,026
197 4,291,027
238 4,291,028
4,291,029
245 4,291,030
246 4,291,031
248.51 4,291,032
250 4,291,033
4,291,034
251 4,291,035
4,291,036
253 4,291,037
256 4,291,038
4,291,039
263 4,291,040
267 4,291,041
4,291,042
269 4,291,043
4,291,044
270 4,291,045
272 4,291,046
273 R 4,291,047
274 4,291,048
275 4,291,049
278 4,291,050
4,291,051
282 4,291,052
283 4,291,053
298 4,291,054
4,291,055
304 4,291,056
4,291,057
308 4,291,058
311 4,291,059
316 4,291,060
322 4,291,062
331 4,291,061

CLASS 425

62 4,290,740
77 4,290,741
313 4,290,742
461 4,290,743
541 4,290,745
543 4,290,744

CLASS 426

319 4,291,063
397 4,291,064
549 4,291,065
578 4,291,066
582 4,291,067

CLASS 427

88 4,291,068
140 4,291,069
213 4,291,070
220 4,291,071
243 4,291,072
314 4,291,073
367 4,291,074

CLASS 428

8 4,291,075
31 4,291,076
76 4,291,077
91 4,291,078
116 4,291,079
4,291,080
119 4,291,081
138 4,291,082
163 4,291,083
212 4,291,084
215 4,291,085
242 4,291,086
288 4,291,087
313 4,291,088
325 4,291,089
327 4,291,090
336 4,291,091
349 4,291,092
379 4,291,093
380 4,291,094
391 4,291,095
398 4,291,096
412 4,291,097
4,291,098
421 4,291,099
424.2 4,291,100
514 4,291,101
537 4,291,102
589 4,291,103
594 4,291,104
616 4,291,105

CLASS 429

1 4,291,106
104 4,291,107
193 4,291,108

CLASS 430

42 4,291,109
59 4,291,110
107 4,291,111
110 4,291,112
202 4,291,113
253 4,291,114
271 4,291,115
308 4,291,116
309 4,291,117
313 4,291,118
348 4,291,119
531 4,291,120

CLASS 431

328 4,290,746
359 4,290,747
4,290,748

CLASS 432

13 4,290,749
106 4,290,750
214 4,290,751
235 4,290,752
261 4,290,753

CLASS 433

56 4,290,754
173 4,290,755
225 4,290,756

CLASS 434

4,290,757
4,290,758
310 4,290,759

CLASS 435

10 4,291,121
31 4,291,122
94 4,291,123
162 4,291,124
240 4,291,125

CLASS 440

51 4,290,760

CLASS 455

88 4,291,411
154 4,291,412
164 4,291,413
4,291,414
328 4,291,415

CLASS 474

138 4,291,416
190 4,290,761
210 4,290,762

CLASS 493

341 4,290,763
395 4,290,764

CLASS 501

13 4,290,813
107 4,290,814

CLASS 518

713 4,291,126

CLASS 521

54 4,291,128
103 4,291,129
136 4,291,130

CLASS 525

5 4,291,131
53 4,291,132
74 4,291,133
92 4,291,134
101 4,291,135
102 4,291,136
162 4,291,137
247 4,291,138
314 4,291,139
321 4,291,140
351 4,291,141
420 4,291,142

CLASS 526

123 4,291,143

CLASS 528

26 4,291,144
89 4,291,145
119 4,291,146
4,291,147
142 4,291,148
188 4,291,149
199 4,291,150
4,291,151
289 4,291,152
290 4,291,153
335 4,291,154
358 4,291,155

CLASS 536

1 4,291,156
17 A 4,291,157
115 4,291,158

CLASS 542

400 4,291,159

CLASS 544

17 4,291,160
193 4,291,161
199 4,291,162

CLASS 546

164 4,291,163
183 4,291,164
345 4,291,165

CLASS 549

51 4,291,166

CLASS 556

430 4,291,167
441 4,291,168

CLASS 560

45 4,291,169
76 4,291,127
126 4,291,170
156 4,291,171

CLASS 562

503 4,291,172
4,291,173

CLASS 568

330 4,291,174
4,291,175
381 4,291,176
726 4,291,177
764 4,291,178
882 4,291,179

CLASS 585

320 4,291,180
4,291,181
415 4,291,182
443 4,291,183
4,291,184
467 4,291,185
475 4,291,186
644 4,291,187
752 4,291,188
860 4,291,189

CLASSIFICATION OF DESIGNS

D2—	7	260,820		43	260,841		121	260,863		66	260,889		92	260,907		36	260,928
D3—	71	260,821		64	260,842		157	260,864		68	260,890		95	260,908		38	260,929
D4—	35	260,822		77	260,843			260,865		70	260,891	D21—	15	260,909			260,930
D6—	42	260,823		131	260,844		160	260,866		73	260,892			260,910			260,931
	48	260,824	D8—	30	260,846			260,867		77	260,893		92	260,911		53	260,932
	60	260,825		62	260,847		180	260,868		78	260,894		122	260,912		62	260,933
	73	260,826		71	260,848			260,869		86	260,895		137	260,913	D25—	11	260,934
	80	260,827		94	260,849			260,870		100	260,886		148	260,914		91	260,935
	97	260,828		356	260,850	D12—	85	260,871		105	260,884		160	260,915	D26—	28	260,936
	114	260,829		376	260,851		146	260,872		106	260,885		171	260,916		35	260,937
	125	260,830		381	260,852		174	260,873			260,887		177	260,917		91	260,938
	130	260,831		385	260,853		209	260,874		115	260,883			260,918		93	260,939
	132	260,832		395	260,854	D13—	4	260,876	D15—	9	260,896		206	260,919		97	260,940
	161	260,833		403	260,855			260,877		9.2	260,897		211	260,920	D27—	36	260,941
		260,834	D9—	372	260,856		01	260,875		12	260,898		212	260,921		42	260,942
	172	260,835		376	260,857		13	260,878		28	260,899		253	260,922			260,943
	177	260,836		386	260,858		28	260,879	D16—	27	260,902	D22—	28	260,923			
	179	260,837	D10—	16	260,859		99	260,880			260,903	D23—	58	260,924	D28—	46	260,944
	205	260,838		110	260,860	D14—	11	260,881	D18—	7	260,904		127	260,925	D32—	22	260,900
D7—	14	260,839	D11—	79	260,861		12	260,882	D19—	41	260,905		150	260,926		32	260,901
	22	260,840		92	260,862		53	260,888		77	260,906	D24—	10	260,927		40	260,845

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